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# FINAL REPORT - VOLUME 1

## EX-POST EVALUATION OF THE RSAP

SPECIFIC CONTRACT

DG TREN A2/143-2007 Lot 2 Impact Assessments and Evaluations in the field of transport

*The preparation of the European Road Safety Action Program  
2011-2020*

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# Index

<b>INDEX</b>	<b>1</b>
<b>FIGURES</b>	<b>3</b>
<b>TABLES</b>	<b>4</b>
<b>BOXES</b>	<b>5</b>
<b>PREFACE</b>	<b>6</b>
ACKNOWLEDGEMENT	7
SUMMARY OF THE EX-POST EVALUATION OF THE ROAD SAFETY ACTION PROGRAMME 2001-2010	8
SUMMARY OF THE IMPACT ASSESSMENT OF THE EUROPEAN ROAD SAFETY PROGRAMME 2011-2020	14
LIST OF ACRONYMS AND ABBREVIATIONS	22
<b>1 INTRODUCTION</b>	<b>24</b>
1.1 BACKGROUND	24
1.2 OBJECTIVES	29
1.3 METHODOLOGY	30
1.4 STATISTICAL SOURCES	32
1.5 STRUCTURE OF THE REPORT	33
<b>2 STAKEHOLDER CONSULTATION ON RSAP</b>	<b>35</b>
2.1 MAJOR FINDINGS	36
<b>3 OVERVIEW AND ANALYSIS OF THE RSAP MEASURES</b>	<b>39</b>
<b>4 EX-POST EVALUATION OF RSAP</b>	<b>58</b>
4.1 CONTEXT: ROAD SAFETY IN THE EUROPEAN UNION	58
4.1.1 <i>The target of reducing the number of road accident victims</i>	58
4.1.2 <i>Characteristics of road fatalities</i>	67
4.2 COMPLYING WITH BASIC ROAD SAFETY RULES	72
4.2.1 <i>Enforcement of road safety rules</i>	72
4.2.2 <i>Road safety awareness</i>	73
4.3 DRIVING LICENSING AND TRAINING	74
4.4 IMPAIRED DRIVING	78
4.4.1 <i>Alcohol</i>	79
4.4.2 <i>Drugs</i>	81
4.4.3 <i>Fatigue</i>	82
4.5 ACCIDENT PROTECTION OR PASSIVE SAFETY	83
4.5.1 <i>Motorcycles and mopeds</i>	83
4.5.2 <i>Vulnerable road users</i>	85
4.5.3 <i>Vehicle occupants' protection</i>	87
4.5.4 <i>Vehicle crash compatibility</i>	92
4.6 ACCIDENT PREVENTION OR ACTIVE SAFETY	93
4.7 ROAD INFRASTRUCTURE	95
4.8 PROFESSIONAL DRIVERS	97
4.9 EMERGENCY SERVICES AND CARE FOR ROAD ACCIDENT VICTIMS	100
4.10 ACCIDENT DATA COLLECTION, ANALYSIS AND DISSEMINATION	102

4.11	BUILDING STAKEHOLDERS' COMMITMENT.....	103
4.12	RESEARCH AND OTHER PROJECTS: A CROSS-SECTIONAL ANALYSIS.....	104
<b>5</b>	<b>CONCLUSIONS .....</b>	<b>107</b>
5.1	MAJOR FINDINGS OF THE EX-POST EVALUATION .....	107
5.2	WHAT REMAINS TO BE DONE.....	108
	<b>BIBLIOGRAPHY .....</b>	<b>111</b>
	INTERNET SOURCES .....	120
	<b>ANNEX 1.1 STAKEHOLDER CONSULTATION ON RSAP .....</b>	<b>122</b>
	<b>ANNEX 1.2 RSAP MEASURES FACT SHEETS.....</b>	<b>134</b>

## Figures

<i>Figure 1: Measures for each category classified by state of implementation</i>	54
<i>Figure 2: Measures for each category classified by effectiveness</i>	55
<i>Figure 3: Measures for each category classified by efficiency</i>	55
<i>Figure 4: Measures for each category classified by sustainability</i>	56
<i>Figure 5: Measures for each category classified by results</i>	56
<i>Figure 6: Target and actual evolution of road fatalities in the EU27</i>	59
<i>Figure 7: Road fatalities in 2001 and 2008 and 2009 estimates</i>	61
<i>Figure 8: Road fatalities, variation between 2001 and 2008 and 2009 estimates (%)</i>	61
<i>Figure 9: Road fatalities, comparison between old and new Member States</i>	62
<i>Figure 10: Road fatalities per million inhabitants in 2001 and 2008 and 2009 estimates</i>	63
<i>Figure 11: Road fatalities per million inhabitants, variation between 2001 and 2008 and 2009 estimates (%)</i>	63
<i>Figure 12: Evolution of road fatalities, injuries and accidents in the EU27 (year 2001 = 100)</i>	65
<i>Figure 13: Road accidents, 2001 and 2008</i>	65
<i>Figure 14: Road injuries, 2001 and 2008</i>	66
<i>Figure 15: Road accidents and injuries, variation between 2001 and 2008 (%)</i>	66
<i>Figure 16: Fatalities by type of road users, 2007</i>	67
<i>Figure 17: Fatalities by gender, 2007</i>	68
<i>Figure 18: Fatalities by age group, 2007</i>	69
<i>Figure 19: Fatalities by transport mode, 2007</i>	70
<i>Figure 20: Fatalities by type of road, 2007</i>	71
<i>Figure 21: Fatalities by type of road, 2007</i>	71
<i>Figure 22: Rural roads: fatalities by type of road users, 2005</i>	72
<i>Figure 23: Young people road fatalities, 2007 and 2001</i>	75
<i>Figure 24: Young people road fatalities per million inhabitants, 2001 and 2007</i>	77
<i>Figure 25: Young people road fatalities per million inhabitants, 2007 and 2001 (%)</i>	77
<i>Figure 26: Car occupants' fatalities, 2001 and 2007 percentage variation</i>	88
<i>Figure 27: Children fatalities, 2007 and 2001</i>	89
<i>Figure 28: Children road fatalities per million inhabitants, 2001 and 2007</i>	91
<i>Figure 29: Children road fatalities per million inhabitants, 2007 and 2001 (%)</i>	91
<i>Figure 30: The chain of help</i>	101

## Tables

<i>Table 1: List of the RSAP measures</i>	26
<i>Table 2: Template for measure description and evaluation</i>	39
<i>Table 3: Summary of the measure evaluation</i>	40
<i>Table 4: Summary of the measure evaluation at aggregate level</i>	57
<i>Table 5: Road fatality per 1 billion vehicles-km</i>	64
<i>Table 6: Population and fatalities by age group, 2007</i>	69
<i>Table 7: Young people road fatalities, 2007 and 2001 percentage variation</i>	76
<i>Table 8: Road traffic deaths (2007) involving alcohol and national BAC limits</i>	80
<i>Table 9: Killed drivers impaired by drugs as percentage of all killed drivers</i>	81
<i>Table 10: Percentage of accidents where the main cause is fatigue</i>	82
<i>Table 11: Fatalities involving motorcycles and mopeds</i>	84
<i>Table 12: Fatalities of pedestrian and cyclist, percentage variation</i>	86
<i>Table 13: Children road fatalities, 2007 and 2001</i>	90
<i>Table 14: Trend in the fatalities for HGVs and lorries under 3.5 ton</i>	98
<i>Table 15: Best and worst performing countries in relation to the number of checks</i>	99
<i>Table 16: Probability of being checked (transport of dangerous goods)</i>	100
<i>Table 17: Research activities in the field of road safety funded by the European Commission</i>	105

## Boxes

<i>Box 1: Enforcement of road safety rules: Stakeholders' main comments</i>	73
<i>Box 2: Impaired driving: Stakeholders' main comments</i>	79
<i>Box 3: Accident protection of passive safety: Stakeholders' main comments</i>	83
<i>Box 4: Motorcycles and mopeds: Stakeholders' main comments</i>	85
<i>Box 5: Vehicle crash compatibility: Stakeholders' main comments</i>	92
<i>Box 6: Accident prevention of active safety: Stakeholders' main comments</i>	94
<i>Box 7: Road infrastructure: Stakeholders' main comments</i>	96
<i>Box 8: Professional drivers: Stakeholders' main comments</i>	100
<i>Box 9: Accident data collection, analysis and dissemination</i>	103
<i>Box 10: Building stakeholders' commitment: Stakeholders' main comments</i>	104
<i>Box 11: EU funded research: Stakeholders' main comments</i>	106

## Preface

This report has been prepared for and funded by the European Commission's Directorate General for Energy and Transport (DG TREN) in the framework of the project "The preparation of the European Road Safety Action Program 2011-2020" (ERSAP).

This project is part of a broader set of actions, all undertaken with the goal to feed into the next European Road Safety Action Program. These actions include - apart from this project - the organization by DG TREN of different workshops, an internet consultation, inter-service group meetings between different Commission Directorates Generals and a stakeholders meeting. The results of this project can serve as an input for the Commission Impact Assessment of a new ERSAP.

The tasks of the project are two-fold:

- 1) carrying out an **ex-post evaluation** of the measures contained in the current Road Safety Action Program (2001-2010) (RSAP).
- 2) carrying out an **impact assessment** for the new European Road Safety Action Program (2011-2020) (ERSAP).

The outcomes of the analysis are published in two separated Volumes with a common preface and executive summary.

The **ex-post evaluation** of the 62 measures of the RSAP 2001-2010 is presented in Volume 1. This report focus on the state of implementation and the impacts of the measures, looking at the:

- *effectiveness*: what effects, in road safety-terms, have been obtained by the measures?
- *efficiency*: how economically have the various inputs been converted into outputs and results (cost-effectiveness)? Were the (expected) effects obtained at a reasonable cost (quantified cost/benefits analysis)?
- *consistency*: is the measure consistent with other measures that have the same or a comparable objective?
- *sustainability*: will the effects achieved last in the medium or long term?
- *negative effects from non-implementation*: what effects have resulted from the non-implementation of measures compared with the estimated effects of their implementation?

A comprehensive analysis is performed for each measure and at aggregate level.

The **impact assessment** of the different policy options proposed for the ERSAP 2011-2020 is presented in Volume 2. In particular, this report deals with:

- analysing the main policy options proposed by the Commission and their impacts;
- comparing the policy options and, if necessary, proposing additional options;
- outlining how the preferred option could be monitored and evaluated in the future.

## ***Acknowledgement***

We would like to take the opportunity to thank the different members of the Road Safety Unit of DG TREN and of the Impact Assessment steering group for their most valuable comments. Furthermore, the input from the stakeholders is also greatly appreciated. The consultants found the ex-post evaluation and the impact assessment and the ensuing results very interesting. We have worked on it with great pleasure.



## **Summary of the Ex-post evaluation of the Road Safety Action Programme 2001-2010**

The main purpose of the ex-post evaluation is to undertake an ex-post evaluation of the relevant measures contained in the current Road Safety Action Programme 2001-2010 (RSAP). These measures aim at halving the number of European deaths and cover three fields of action: road users behaviour, vehicle safety and road infrastructure, in particular the following topics:

- enforcement;
- awareness campaigns;
- training and driving licenses;
- impaired driving;
- passive and active vehicle safety;
- infrastructure;
- professional drivers;
- post crash medical care;
- statistics and monitoring;
- building stakeholders' commitment.

**Methodologically**, the measures have been analysed at both individual and aggregate level, based on three main dimensions (state of implementation, timing of the effects, and type of impact). Moreover, the consistency between measures has been analysed such in a way to highlight the combined effects of different actions addressing the same issue. As a result, effectiveness, efficiency and sustainability of the measures have been evaluated.

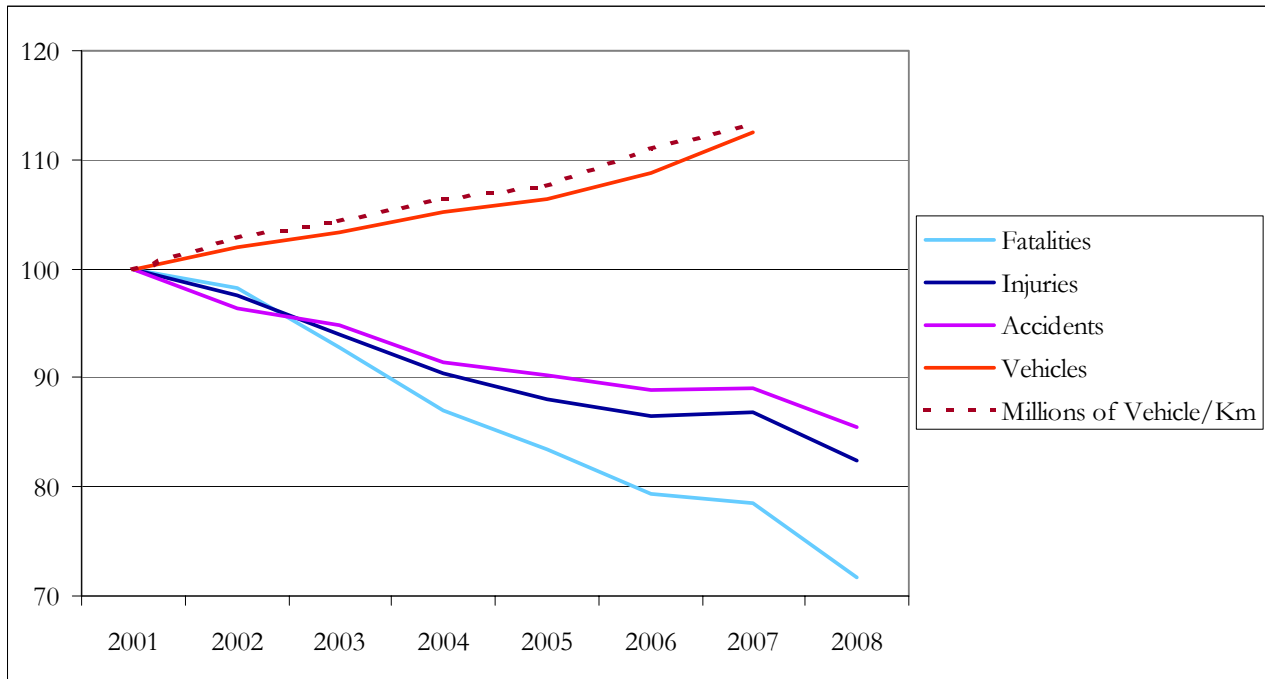
Importantly, since the RSAP measures are not homogenous (namely by nature and level of implementation), each measure has been analysed according to its specific characteristics, so to make sure that the best evaluation approach is chosen. Therefore the evaluation leads more to a rating of the impact for each RSAP measures (“the success of their implementation”) rather than a ranking of the measures themselves on their potential contribution to the RSAP objectives.

**The year 2008 recorded 38,900 victims and 1,636,900 injuries in 1,250,000 road accidents for a total social cost of 140.8 billion Euro.**

The first RSAP measure sets the ambitious objective of **halving the number of European road deaths** per year by 2010, from about 54,300 in 2001 to about 27,100 in 2010. Looking at the data, nonetheless, it appears that the goal will not be reached. In fact, even if the fatalities have been steadily declining since 2001, reaching about 38,900 deaths in 2008, the average reduction in the EU27 was only 28%, that is far from the 42% that should have been reached in 2008 to stay in line with the target. In 2009 as well, according to the latest CARE estimates (still to be confirmed and properly analysed) which indicate an average reduction to about 35,500 road fatalities, the decrease in road deaths (-35%) is still far from the 2009 target value (-46%). The gap between the actual number of fatalities and the original RSAP objective in 2008 is estimated at 7,200 fatalities, which equals a social loss of about 11 billions euro.

However, this does not mean that the RSAP did not have a positive impact on road safety. As described in the Chart below, road safety improved significantly over time in the EU, despite the high growth in mobility. It is possible to estimate that, since 2001, almost 20,500 lives have been saved, with a total social value of 31.2 billion euro.

*Evolution of road fatalities, injuries and accidents in the EU27 (year 2001 = 100)*



*Source: TRT elaboration on CARE and EUROSTAT data*

In particular, the Chart shows that the number of road deaths has decreased at a much faster pace than the number of accidents and injuries: the first saw a reduction of 28%, while accidents and injuries decreased only by 14.6% and 17.6% respectively. This means that the reduction in road fatalities has been the result not only of a reduction in the absolute number of accidents, but also of a reduced impact of road accidents on human lives.

In this respect, **the impact of enlargement** should also be reminded. When the RSAP was designed, the target set did not include the 12 new Members, which at the time of the accession presented quite a poor performance in terms of road safety. Between 2001 and 2008, the reduction in road fatalities was only 4.2% in these countries, while the old Member States, instead, performed much better in achieving the target, reaching a reduction of 36.8% on average. However, if the CARE estimates for 2009 are confirmed, a converging process emerges in the performance of the new Members already in this last year: in fact, the 12 New Member States presents an average reduction in road fatalities since 2001 of 16.8%, while the EU15 of 40.8%. Nevertheless, the difference between old and new Member States in terms of fatalities per million inhabitants remains very large.

The main characteristics of the road fatalities occurring in the EU are:

- the large majority of the road deaths (80%) concerns vehicle occupants, amongst which 60% concerns the driver and 20% the other passengers of the vehicle;
- men represent 76% of the total road fatalities, while women only 24%;
- the most affected age category is the group aged between 25 and 64 years old, but the young people aged between 15 and 24 years are the most overrepresented in road fatalities;
- passengers cars and taxis represents almost the half of the transport modalities concerned in deadly accidents. However, the relative importance of the percentages regarding vulnerable road users (cyclists and pedestrians), motorcycles and mopeds should be noted;
- almost 55% of the fatal accidents occurs in rural roads and about 36% in urban areas; only 6% occur in motorways.

**Enforcement** remains a key factor in creating the conditions for a considerable reduction in deaths and injuries, especially when it is intensively applied and widely publicised. Therefore, measures on enforcement should be present in the new RSAP. Among the main priorities, there is the setting up of a system for managing cross-border enforcement of traffic offences.

**Awareness campaigns** are evaluated as effective actions to promote road safety, namely if they are organised as a large national campaigns combined with enforcement and other measures. Repeated and continued advertising and communication have been carried out in the different Member States to ensure a remarkable behavioural change of the target groups.

The measures concerning **training and driving licenses** reached all a good level of advancement, but their impact is still difficult to evaluate, since most of the effects are going to be evident only in the longer period. However, many actions have been taken to improve driving education at the research level, but also at the legislative level. In this respect, it will be particularly interesting to see the actual impact of the Directive 2006/126/EC, that will replace Directive 91/439 on the 19th January 2013 introducing minimum standards for car driving examiners and a staged driving licensing system for motorcyclists and professional drivers.

Concerning the issue of **impaired driving**, i.e. driving under the influence of alcohol or psychoactive substances or with a high level of fatigue, many initiatives have been carried out in the field of awareness campaign, education and enforcement, but a lot still needs to be done. In particular, the technology of impairment detection devices is not sufficiently mature and would need further developments and the research on the effects on driving of drugs should be deepened, finalising the labelling action for what concerns legal substances.

The measures taken in the framework of **passive vehicle safety** overall present a medium advancement, considering that their implementation depends on the vehicles renewal rate (the total fleet is expected to be completely renewed in about 14 years). Between 2001 and 2007, occupants' safety has been remarkably increasing. In general, both the effectiveness and the efficiency of passive

vehicle safety improvements have proven to be positive. Generally the technologies themselves are not hugely expensive, but they have a great impact on injury and fatality reduction.

Also the measures related to the **active safety of vehicles** present a good state of advancement, but their impact on safety is expected only in the medium or long term. In fact, most of these measures involves thematic studies and researches whose results will be deployable in a second step, when they may find their concrete application in the vehicle industry. Overall, the effectiveness of the action taken within this framework is positively evaluated, since they may play a considerable role in reducing the number of road accidents by assisting the driver and providing a remedy for human errors, which is by far the main cause of road traffic accidents.

Concerning **infrastructure**, at present all measures show a “low” or “medium” level of advancement, with the exception of the measures on the safety for the Trans-European Network and on tunnels. However, the actions aimed at improving infrastructure safety are expected to give a high contribution to road safety in the medium and long term, with long-lasting effects.

With regard to the issue of the **professional drivers**, over the last eight years there has been a general reduction in the number of fatalities related to commercial vehicles, for what concerns both lorries under <3.5 tons (-22.2% during the period 2001-2007), and Heavy Goods Vehicles (-4.9% during the period 2001-2007). The measures covered by the current RSAP have been translated into several legislation acts on some major issues which have an indirect positive impact on road safety: for example, work intensity and related stress, fatigue, driving times and rest periods. Specific attention has also been paid to the transport of dangerous goods. The results have been evaluated overall as “medium”, with the exception of the measure on the digital tachograph and on the legislation of driving and rest periods for commercial road haulage, whose impact is rated as “high”.

Two measures have effectively addressed the domain of the **post crash medical care**: the exchange of best practices and the implementation of the eCall system, which provides automated messages to the emergency services in case of a road accident. High potential benefits are expected from such initiatives, especially once their outcomes will be concretised and widely adopted.

Concerning **statistics and monitoring**, over the years improvements have been remarkable: today numerous new indicators and observed variables are available for the research, monitoring and evaluation activity in the field of road safety. Nevertheless, a lot still needs to be done to complete the set of data of the different Member States and to integrate and apply the results of the various statistical studies carried out until now.

The actions that have aimed at **building stakeholders’ commitment** in the domain of road safety contributed to implement a shared responsibility among all the actors involved, indirectly supporting the increase in traffic safety and the reduction of road fatalities.

Most of the RSAP measures have involved **research activities** and thematic studies in different areas of road safety. The total amount invested in the research activity, including private funding, is almost 900 millions Euro, out of which about 550 millions have been provided by the EC, with an estimated<sup>1</sup> average benefit-cost ratio equal to 7:1, indicating a strong cost-effectiveness of these investments.

All the **projects funded by DG TREN** may be inscribed in the framework of one or more measures of the RSAP. However, there are areas that have not been addressed by the Programme. For example, traffic calming measures and a more rational use of road transport (car pooling, car sharing and promotion of public transport and of bicycle use) in relation not only to traffic safety, but also to environmental performance.

To corroborate the analysis on the RSAP impacts on road safety, a **stakeholder consultation** was carried out, involving European organisations active in the field and the competent National Authorities. This exercise looked specifically at the ex-post evaluation of the RSAP measures and their impacts, hence differing from the public consultation (consisting of six thematic workshops, a stakeholder meeting and an internet consultation) focused on the next ERSAP 2011-2020.

In total, 24 replies have been received, out of which: 12 have been provided by private stakeholders and 12 by national authorities. Regarding the former, at least one European stakeholder for each RSAP area of action has actively participated to the consultation. Regarding the latter, a good representativeness of EU countries has been assured, by having received answers from both old and new Member States, from big and small countries and from countries with a good and poor performance in road safety. The majority of the consulted stakeholders (about 46% of the respondents) consider the RSAP impact on road safety as “high”, at least potentially, while about 33% of the respondents rate the RSAP impact as “medium”. Among the stakeholders, it may be interesting to point out that the National Authorities have more often responded as “medium”, while the private sector has rather expressed a strong impact. Importantly, the majority of those Member States that rated the impact of the RSAP as “high” are new Member States.

Vehicle design improvements, education and training initiatives, enforcement and legislation are generally considered as the most effective measures in helping to reduce casualties. Most of stakeholders have also underlined the important role played by awareness campaigns and better pedestrian facilities as major contributors to the reduction of road casualties.

Within the ex-post evaluation, several **priority areas** have been identified as posing particular concern and deserving special attention in the next ERSAP: young drivers, impaired driving, speed, vulnerable road users (pedestrian and cyclists), motorcyclists and rural roads. Moreover, from the analysis it emerges that, in general, the new Member States present a lower performance in road safety and need special support to fill in the gap with the old Members.

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<sup>1</sup> European Commission DG Energy and Transport, “Research, technological development and studies on road safety 2001-2008: their impact on policy making”, Draft, 27 May 2009.

Given all these findings, **various elements** can be identified that can prove helpful in the creation of the new ERSAP. On one hand, a number of specific problem fields (like the ones mentioned above) deserve a particular focus in the new ERSAP. The level of focus could even go as far as proposing measures that allow for more tailor-made practical implementations for Member States. On the other hand, with the foreseen availability of more and more detailed data on accidents, fatalities and injuries, flexibility in the selection or creation of measures can become even more important for the new ERSAP. More detailed data would allow for the recognition of upcoming problems requiring prompt action.

All this may suggest that the structure of the new ERSAP may present **a certain degree of flexibility** by providing the Member States a more open framework for implementing the new measures in the future priority areas. This would leave them the possibility to better fine-tuning their actions to the ERSAP requirements according to their specific needs and problems.

In this respect, it is relevant to understand if **quantified targets** should continue to be set or not. According to the stakeholder consultation, setting a quantified target for further reducing road victims is seen as crucial for an effective commitment, benchmarking, monitoring and evaluation of the actions aimed at increasing road safety.

**Monitoring and statistics** are a fundamental activity and need accurate road safety data. As already mentioned, the completion of the set of data and the development of specific indicators need to be finalised, since without them policy development and evaluation become very difficult, if not impossible.

In conclusion, a renewed effort is necessary and the new ERSAP should provide stakeholders at a joint European level with a set of measures that may help redouble the effort. These measures should be aimed more specifically where there is greater need: at particular Member States, at specific categories of road users or at those roads that perform significantly worse in comparison to the average.

More details on the ex post evaluation of the current RSAP can be found in “The preparation of the European Road Safety Action Program 2011-2020- Volume 1”.

## **Summary of the Impact assessment of the European Road Safety Programme 2011-2020**

The goal of the impact assessment is the making of a scientifically sound impact assessment that covers the economic, environmental and social impact of the different measures that are proposed by the European Commission. These measures are proposed as a result of different workshops organised by DG TREN, an internet consultation, inter-service group meetings between different Commission Directorates Generals and a stakeholders' conference that was organised on December 2<sup>nd</sup>, 2009.

The impact assessment itself consists of the comparison of different economic, environmental and social impacts of different scenarios and options against a business as usual scenario. These scenarios are, roughly sketched, different courses that can be taken by the European Commission (DG TREN). The business as usual scenario (BAU) represents the expected situation in 2020 if no particular surplus action would be undertaken compared to the current situation. The first scenario assumes improved implementation and enforcement of the current actions but without new measures for other domains in road safety being taken (scenario A). The second scenario represents a possible choice by the European Commission for the implementation of new measures into a new European Road Safety Action Programme (scenario B). Scenario B is not meant as a definitive representation of the new ERSAP, and therefore its assessment should not be seen as an appraisal of the new ERSAP. In fact, the shape and constitution of the new Strategy were not known at the time of drafting this report. Scenario B consists of a list of possible measures sent by the Commission services. These measures act as building blocks which can be combined in different ways leading to several options for a new ERSAP that can then serve as an input for the next ERSAP. As such, starting from this set of measures, the impact assessment analyses the effect of two options and assesses the risks and uncertainty of the assumptions following the methods proposed in the document *Impact Assessment Guidelines*<sup>2</sup>.

The next paragraphs discuss sequentially the current road safety situation, the different scenarios, the results of the calculations and the conclusions.

### **Situation description**

In order to make a correct assessment of the impact of different possible policy choices, it was important to create a correct image of the evolution in road safety situation in terms of fatalities and injuries in the EU over a period from 2001 up to 2008. To do so, a number of problem fields had to be identified resulting in the following list of key target fields:

- *Problems in specific Member States*: in relative terms, an average reduction in traffic related deaths per million inhabitants of 30.6% can be found in the EU27 Member States in 2008. This is a significant reduction. A number of Member States have outperformed this average decline in traffic related deaths. On the other hand, some countries effectively scored worse or similar in 2008 in comparison to 2001 and traffic safety actually decreased or remained the same. A

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<sup>2</sup> European Commission (2009), Impact Assessment guidelines, SEC (2009)92

- higher potential for gains in terms of road fatalities exists in these countries. At the same time most Member States have managed to decrease the number of traffic injuries from 2001 to 2008. Nevertheless, some countries actually suffer an increase in traffic accident related injuries over this period. It is unclear whether this finding is the result of data collection problems or is an accurate representation of the actual safety situation.
- *Age related issues:* three particular age groups can be identified that are at risk. In particular, children aged younger than 15 years old, young and novice drivers and older drivers are at risk of dying or being injured in traffic. Children aged younger than 15 years old are relatively underrepresented in traffic fatality and injury statistics. Furthermore, a relative decrease has been found for the period between 2001 and 2008 indicating the beneficial effect of particular measures for this age group. On the other hand, young and novice drivers aged between 18 and 24 years old are severely overrepresented in traffic fatality and injury statistics. Furthermore, although an overall decline in the percentage of fatalities or injuries in this age group was found, some countries actually experienced an increase in the relative number of traffic victims in this age group. This finding is alarming. The third group, elderly drivers, becomes more and more important. Population projections<sup>3</sup> indicate that both the absolute as well as relative numbers of people aged more than 65 will increase over the next years and decades. Although a decline in fatalities in absolute numbers was found for elderly drivers, the relative number actually rose. This indicates a slower progress in road-safety compared to other age-groups and specific measures to help this age group might be considered.
  - *Vulnerable road users:* fatalities with pedestrians and bicycles make up 26.5% of the total number of fatalities. The relative percentage of vulnerable road user fatalities in comparison to all other road user fatalities appears to have remained more or less the same. It needs to be noted that some countries experience higher relative fatality rates for this user group. A possible explanation would be the sheer exposure in these countries for cyclists or pedestrians. Nevertheless, measures should be taken for this group of road users.
  - *Key problematic human behaviours:* speeding, drink driving and the (proper) use of restraint systems remain problematic behaviours in relation to fatality and injury rates. Most researchers assume that about 25-30% of fatal and serious accidents are due to excessive speed. 15 to 50% of all vehicles in Europe are said to be travelling at a speed at least 15 km above the speed limit. At the same time, alcohol is considered at least a partial cause in up to 25% of accidents. Although the use of restraint systems is already mandatory for a long time, a significant number of drivers and passengers still refrain from carrying using restraint systems. This, despite the fact that the use of such a system can result in a significant reduction of fatalities and injuries.
  - *Safety on rural roads:* The nature of rural roads and the type, level and speed of traffic they carry differs significantly from urban roads and motorways. This means that the risks people face, and the type of accidents they suffer, on or near rural roads also differ from those on or near urban roads and motorways. Generally, the largest proportion of accidents occurs in urban areas while the most serious crashes happen on rural roads.

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<sup>3</sup> Eurostat (2008). Ageing characterises the demographic perspectives of the European societies – Issue number 72/2008.



- *Motorcycles*: Motorcycle and moped fatalities, together referred to as Powered Two Wheelers (PTW), account for 17% of the total number of road accident fatalities in 2007 in the EU27 countries while accounting for only 2% of the km driven. Powered two wheelers are the only vehicle type for which the number of fatalities consistently increased from 2001 to 2008. Motorcycle fatality numbers rose by 10% (+428 fatalities), which suggests that motorcycle safety measures are a very important topic for the future.
- *The use of vehicle safety technology*: Most of the passive safety measures are developed to protect car occupants. Since about half of all traffic deaths are occupants of cars, passive safety devices can help reduce the number of deaths and injuries for this group. However, if vehicle technology is important, the age of the vehicle fleet and the speed of the rotation is important. Apart from this, the actual correct use of these devices is important. An example is the fact that an important number of persons still do not use restraint devices. With respect to upcoming technologies, such as electric vehicles, not enough data is available to draw any conclusions on their impact on safety.

In general, the following table gives a good representation of the size of particular problem groups or behaviours:

### **Overview of problem areas**

Problem area	%	Traffic deaths	Traffic injuries
Age <sup>a</sup>	Children <15 years	2.80%	6.4%
	Young and novice drivers	17.30%	19.44%
	Elderly	19.40%	8%
Vulnerable road users <sup>a</sup>	Pedestrians	20%	10%
	Cyclists	6.5%	6.3%
Behaviour <sup>c</sup>	Speeding	38%	21%
	Drinking	10-33%	10-24%
	Fatigue	6-15%	6-15%
Rural Roads <sup>b</sup>		58%	26%
PTWs <sup>b</sup>		17%	20,6%
New types of cars		No data	

Source: Calculations TML,

<sup>a</sup>: data 2007, based on CARE database

<sup>b</sup>: data 2008, based on CARE database

<sup>c</sup>: no real yearly base, taken from literature

### **Scenario description**

Given the identification of these problem groups, we were capable of calculating the influence of different policy choices on road safety but also – albeit on a more general level - on economical, environmental and social aspects. Three different scenarios were identified and calculated to enable a

comparison: a Business As Usual scenario, an A scenario (enforcement) and a B scenario (including candidate measures for a possible new ERAP).

The Business As Usual scenario (BAU) serves as a reference for further calculations. This scenario assumes that no additional efforts will be made to reduce the number of fatalities apart from the activities identified in the Transport White Paper of 2001 and its mid term review in 2005. As the RSAP only covers the period 2001-2010, this scenario implies that after 2010 no actions would be taken other than actions that are taken anyway by Europe, by national and local authorities and by other stakeholders. This also implies that measures taken today remain at least at the same level as before and that for example, the autonomous changes in vehicle technology continue.

Scenario A represents the situation where there is an improved implementation and/or enforcement of the existing legislation, including the impacts of the proposed Directive on cross-border enforcement. In order to provide an estimation fork for the effective influence of such a measure, two sub-scenarios were identified. A “normal” A scenario with an implementation level that would be considered feasible and a “maximal” A scenario with an implementation level that would be considered exceptionally high, but which can serve as a theoretical benchmark.

Scenario B captures the different measures that could be used as input for the European Commission impact assessment. In total, about 130 individual measures, were presented by the stakeholders and the ex post evaluation concerning education, enforcement, infrastructure, vehicle technology and post crash aid. Each measure can be considered a possible building block that supports the EC policy to increase traffic safety. Based on these results, the Commission provided us with a selection of measures which could be included in the next ERSAP. This selection led to the creation of two policy options which only differ with respect to the enforcement measures included. Obviously, these are only two of the possible combinations of building blocks (measures).

Similar to the A scenario, some sensitivity for these two policy options was created at the level of the measures to provide an estimation fork of the effective outcome of the different proposed measures. A “normal” option B with what would be considered a feasible implementation level of that combination of measures and a “maximal” option B representing an exceptionally high level of implementation of this combination of measures. We should note that possible findings in relation to the effectiveness of a particular measure also depend on the presence (or absence) of other measures in the B scenario. A fictive example: an effect of the introduction of randomised blood alcohol content (BAC) tests to prevent drink driving by younger people would be virtually inexistent if at the same time a measure is introduced that prevents young people to drive during the weekend and nights. Nevertheless, the effect would still be that less young people would be drink-driving.

## Calculation results

To create the BAU scenario, a two-step method was used. In a first step, a time series analysis, based on historical data (1995-2008), for both fatalities and injuries for each country of the EU27 was created.

In the following step, a correction of the trend for road safety measures which are included in the baseline scenario, but which will only have an effect in the period 2010-2020, was applied. For the exact calculation of this scenario, we refer to the report itself. We do want to highlight here that the estimation of traffic safety development is a very difficult task and the results of the estimates should be treated with care.

The results of the calculation of the BAU scenario, when no particular surplus action is taken, can be found in the table below. These results indicate that, based on the declining rates that can be observed in most Member States for the previous years and the expected continued implementation of existing legislation in relation to behaviour, infrastructure and vehicle technology, a decrease in the fatality rate can be expected by 2020. Given the timeframe of the introduction of measures by the European Commission (the effective result in the field would only be noticeable in recent years) in relation to accident or injury avoidance, this result is not completely unexpected. However, as the forecast represents a “continuation of trends” scenario and as it is likely that some of the existing measures are losing their effectiveness over the forecasting period, the forecasts may well be too optimistic. Moreover, it should be emphasised that the predicted reductions will only be achieved by continuing current efforts to improve road safety; they are in no sense predetermined.

***BAU: number of fatalities and injuries in the EU27***

EU27 - 2020	number of fatalities	number of injuries
result step 1	23,566	1,426,838
correction	-1,333	-53,898
BAU	22,233	1,372,941

Source: calculations TML

For the calculation of each of the two alternate scenarios, a corrective factor was introduced similar to the second step in the creation of the BAU scenario. This corrective factor allows for the estimation of the direct effect of the implementation of various measures (enforcement, education, etc.) on road safety on their own. An important issue is the combined effect of combinations of measures. It is often assumed that the several measures are mutually independent, in other words it is assumed that the effect of one measure will not influence the effects of the others. In practice, this will most probably not be the case. The described estimated effect of all measures together, will, in reality, be less. This is taken into account in the estimation of the combined effect. For more explanation on how this is done, we refer to the main text.

Apart from that, indirect effects such as economical, environmental and social impacts can also be expected.

In scenario A this means that the parameters in relation to both the effectiveness and the utilization of ‘legislation and enforcement’ policy options which are already included in the BAU scenario were altered. First of all, a direct safety impact was identified. Compared with the BAU scenario, the A

scenario could lead to a decrease in fatalities of about 29% and a decrease in injuries with 21% in 2020. The maximum A scenario leads to a maximum decrease of about 41% in fatalities and 35% in injuries compared with the BAU in 2020. This is in line with what is stated in literature on the maximum effects of enforcement. Furthermore, the following indirect impacts can be expected as a result of an A scenario:

***Overview of the impacts of scenario A and maximum scenario A***

		Scenario A/Amax: increased enforcement
Direct Impact	Fatalities	-29%/-41%
	Injuries	-21%/-35%
Economic Impact	Households	Possible savings in fuel costs
	Companies	Possibly savings in fuel costs
	Growth	No effect
	Government	Higher expenditures
Environmental impacts	Emissions	Decrease
	Noise	Decrease
Social Impact	Health (other than road casualties)	Small positive effect
	Public Acceptance	Slightly difficult

In scenario B, the direct and indirect effects of two options are calculated. The selection of the measures included in those options is the result of the use of two information sources: the ex-post evaluation of the previous RSAP on one hand and the information available from the stakeholders' conference, internet consultation and workshops organised by DG TREN on the other hand. More detailed information on the proposed measures can be found in the relevant chapters of this document.

The general results of the option B.1-harmonised enforcement and option B.2-targeted enforcement for both the normal and the maximum variant are presented in the table below. For more detailed information on individual measures, we refer to the results in section 5.3.3.3 of the main text. We find that some measures clearly prove to offer a very relevant contribution to traffic safety, both in terms of fatalities as in terms of injuries. This is especially the case for proposed changes in the training process, the setting of national objectives for enforcement, safety audits for infrastructure, and the (retro-)fitting of anti-collision warning devices. However, it should also be noted that the presented size of the effects of the individual measures also depends on the other measures that are included in these particular options B.

### Overview of the general impacts of option B.1 and option B.2

		Harmonised enforcement		Targeted campaigns	
		Option B	Option B max	Option B	Option B max
Direct impact	Fatalities	-27%	-41%	-44%	-60%
	Injuries	-27%	-42%	-36%	-60%
Economic impact	Households	Savings in <ul style="list-style-type: none"> <li>- fuel consumption</li> <li>- medical costs</li> <li>- congestion</li> </ul> Increased costs due to <ul style="list-style-type: none"> <li>- changes in driver training</li> <li>- implementation technological devices</li> </ul>			
	Companies	Savings in <ul style="list-style-type: none"> <li>- fuel consumption</li> <li>- medical costs</li> <li>- congestion</li> </ul> Small increase in costs due to <ul style="list-style-type: none"> <li>- increased control of cargo</li> <li>- more roadside inspections</li> </ul>			
	Growth	No direct effect			
	Government	Higher expenditures due to <ul style="list-style-type: none"> <li>- increased enforcement</li> <li>- research</li> <li>- creating and supporting information exchange platforms</li> <li>- possible subsidies for technological devices</li> <li>- increased infrastructure costs due to road safety audits</li> <li>- administrative costs (change in driving license system, demerit point system, etc.)</li> </ul>			
Environment	Emissions	Decrease			
	Noise	Decrease			
Social Impact	Health	Positive effect			
	Public Acceptance	Possible problems for <ul style="list-style-type: none"> <li>- increased enforcement</li> <li>- curfew measures</li> <li>- acceptance new technologies</li> </ul>			

## Conclusion

Three different scenarios were created to provide a clear background for the assessment of the impact of newly proposed measures for a possible new ERSAP on traffic safety, economy, the environment and health in general: a Business As Usual (BAU) scenario, a scenario with only an increased implementation of existing measures and an increase in enforcement (A scenario) and a scenario where the effect of implementing two options of combinations of new measures for the new ERSAP is estimated (B scenario). These three scenarios represent possible different approaches by the European Commission towards enhancing road safety. A methodology was presented allowing for the building block-like composition of new measures creating options for possible B scenarios. As a result, we are capable of comparing significantly different future scenarios and providing clear indications of direct and indirect gains within the boundaries of the current study.

When we compare the BAU scenario with the A scenario, it becomes very clear that an increase in enforcement comes with a significant increase in traffic safety. This is the case for all key behaviours: speeding, drink driving and the use of restraint devices. Depending on the strength of enforcement, between 29 and 41% of fatalities and 21 and 35% of injuries can be avoided. Increased enforcement of speeding counts is responsible for the highest reduction. Apart from the increased enforcement cost, beneficial effects on the economy, environment and health and general can be expected.

When we compare the two options within the B scenario to the BAU scenario, we find that some measures clearly prove to offer a very relevant contribution to traffic safety, both in terms of fatalities as in terms of injuries. This is especially the case for proposed changes in the training process, the setting of national objectives for enforcement, safety audits for infrastructure, and the (retro-)fitting of anti-collision warning devices. Again, some beneficial effects to the economy and environment can be expected.

These results can be used as a guide for the selection of possible measures for the new ERSAP. They are in no way definitive as far as the final composition of the new ERSAP are concerned but can be considered a valuable guideline in the decision process that the RSU is currently going through. It should be noted however that, with an increase in the amount and detail of data available, a certain level of flexibility and focus on particular problem areas should be considered in order to compose a viable and relevant RSAP.

More details on the impact assessment for the next ERSAP can be found in “The preparation of the European Road Safety Action Program 2011-2020- Volume 2”.

## List of acronyms and abbreviations

ACEA	European Car Manufacturers Association
ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
AND	European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
BAC	Blood Alcohol Limits
CARE	European Road Accident Database
CARS21	Competitive Automotive Regulatory System for the 21st century
CRM	Common Residual Model
DG REGIO	European Commission – Directorate General Regional Policy
DG TREN	European Commission – Directorate General Energy and Transport
DRL	Daytime Running Lights
EC	European Commission
EFTA	European Free Trade Association
EIB	European Investment Bank
EMEA	European Medicines Agency
EP	European Parliament
ERDF	European Regional Development Fund
ERSAP	(New) European Road Safety Programme 2011-2020
ERSO	European Road Safety Observatory
ESC	Electronic Stability Control systems
ETAC	European Truck Accident Causation Study
EU	European Union
EU15	European Union with 15 Member States
EU27	European Union with 27 Member States
EuroNCAP	European New Car Assessment Programme
HGVs	Heavy Goods Vehicles
ICT	Information and Communication Technology
IRTAD	International Road Traffic and Accident Database
Kw	Kilowatt
Kw/KG	Kilowatt Hours per Kilogram
LGVs	Light Goods Vehicles (LGV)
MAIDS	Motorcycle Accident In-Depth Study
MOVs	Multi-Purpose Vehicles
MSD	Minimum Set of Data
NGO	Non-Governmental Organisation
NMS12	European Union New Member States (both 2004 and 2007 accessions)
OECD	Organisation for Economic Cooperation and Development
PTW	Powered Two Wheels

R&D	Research and Development
RID	Regulations concerning the International Carriage of Dangerous Goods by Rail
RSAP	(Current) European Road Safety Programme 2001-2010
RSU	Road Safety Unit
SBR	Seat belts reminders
SPI	Safety Performance Indicators
SUVs	Sport Utility Vehicles
TEN	Trans-European Network
ToR	Terms of Reference
UNECE	United Nations Economic Commission for Europe
US	United States of America
VKM	Vehicle per Kilometre
VRUs	Vulnerable Road Users



# 1 Introduction

This Volume deals with the ex-post evaluation of the relevant measures contained in the Road Safety Action Programme 2001-2010 (RSAP) and documents its main results and conclusions. Its final aim is to serve as an input for the impact assessment of the next European Road Safety Action Programme (ERSAP), which will cover the period 2011-2020.

A review and a thorough ex-post evaluation of the 62 measures included into the RSAP has been undertaken in order to analyse their impacts and level of implementation across the EU Member States, namely in comparison with the major objective of the RSAP consisting in halving the number of road victims by 2010.

In this respect, a stakeholder consultation has also been conducted, which has made possible to: (i) understand, (ii) recognise and (iii) incorporate into the analysis the stakeholders' own evaluation on the current RSAP.

Prior to such review, this Chapter introduces the overall framework for the analysis by describing background, objectives and methodology of the research.

## 1.1 Background

The Road Safety Action Programme 2001-2010 was launched by the European Commission (EC) in 2003 through the adoption of the Communication “European Road Safety Action Programme. Halving the number of road accident victims in the European Union by 2010: a shared responsibility”<sup>4</sup>.

Through the RSAP, the EC has encouraged Member States to identify and implement targeted action plans and to draw up performance indicators drawn up at national level along general guidelines offered in the Communication. The RSAP covers three fields of action:

- road users, through a combination of training, campaigns and law-enforcement measures;
- vehicle, through technical harmonization and support for technological progress;
- road infrastructure improvements.

Globally, the Road Safety Action Programme has set the major goal of halving the number of road deaths by 2010 on the European road network. Specifically, it comprises a set of 62 measures that vary considerably in scope and contents, and that together cover all aspects of road safety. In the document, these measures are grouped in the following seven areas:

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<sup>4</sup> European Commission, COM(2003) 311 final.

- *encouraging road users to improve their behaviour*, where the purpose is to encourage road users to improve their behaviour through stricter compliance with the existing legislation, while harmonizing the penalties, the driving licensing and training at EU level, amongst others;
- *making use of technical progress*, so to make vehicles safer through the harmonization of active and passive safety measures (for example, mandatory fitting of seat belts) and support for technical progress;
- *encouraging the improvement of road infrastructure*, by identifying and eliminating accident black spots;
- *safe commercial goods and passenger transport*, where the main goal is to reduce the number of accidents involving heavy goods vehicles, and regulate the training of commercial drivers and compliance with driving and rest periods;
- *emergency services and care for road accident victims*, where it was called to examine best practice with regard to post-accident medical care;
- *accident data collection, analysis and dissemination*, in order to improve the collection and analysis of data on accidents (monitoring) so as to identify the priority fields of action;
- the introduction of a *European Road Safety Charter*<sup>5</sup>.

The EC has, then, encouraged each Member State (i) to perform at least as well as the best-performing ones and (ii) to emphasise shared responsibility, knowing that road safety-related performance levels vary widely between European countries, and that an integrated approach is necessary for effective actions in the three main components of the road system: (i) users; (ii) vehicle and (iii) road infrastructure.

The European Parliament<sup>6</sup> (EP) has further highlighted how the RSAP has represented a major step forward in addressing the issue of road safety, recognising that road safety is a common responsibility for all decision-makers and stakeholders and requires an integrated intervention.

The Table below provides the complete list of all the 62 measures with their respective classification as in the RSAP (main areas of action). Moreover, the numbering and the categorisation presented in the Terms of Reference (ToR) of this study are illustrated as well (first column on the left).

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<sup>5</sup> <http://www.erscharter.eu/>

<sup>6</sup> Report of the European Parliament on European Road Safety Action Programme – Mid-term review (2006/2112(INI)) Committee on Transport and Tourism, Rapporteur: Ewa Hedkvist Petersen.

Table 1: List of the RSAP measures

	MEASURES	RSAP AREA OF ACTION
<b>GENERALS</b>	1. Reduce the number of road deaths by 50 % by 2010.	Setting the target (monitoring the target)
	2. Evaluate the progress made, compared with the target, by means of appropriate performance indicators at Community and national levels.	Setting the target (monitoring the target)
	3. Provide a report in 2005 on monitoring of the target, action carried out and modifications needed as a result of enlargement and, where appropriate, propose new measures.	Setting the target (monitoring the target)
	4. Invite all parties concerned to sign a European Road Safety Charter.	A commitment at all levels (mobilising stakeholders)
	5. Propose the introduction of harmonised road safety criteria in public service contracts.	Means of action available at EU level
	6. Study, together with the European haulage industry, additional measures which insurers could take to pass the cost of accident risks on more directly.	Means of action available at EU level
	7. Set up a European Road Safety Observatory within the Commission.	Accident data collection, analysis and dissemination
<b>USERS' BEHAVIOUR</b>	8. Propose measures to strengthen checks and ensure the proper enforcement of the most important safety rules.	Encouraging road users to improve their behaviour (complying with basic road safety rules)
	9. Develop best practice guidelines as regards police checks.	Encouraging road users to improve their behaviour (complying with basic road safety rules)
	10. Collect, compare and publish information on national highway codes, and on infringements established and penalties imposed in the various countries.	Encouraging road users to improve their behaviour (complying with basic road safety rules)
	11. Participate in awareness campaigns about drinking and driving, seat belts, speed and fatigue, if possible combined with national police activities.	Encouraging road users to improve their behaviour (complying with basic road safety rules)
	12. Encourage the application of the recommendation on the blood alcohol limit; continue work on the effects of drugs and medicines; establish appropriate classification and labelling of medicines which affect driving ability.	Encouraging road users to improve their behaviour (complying with basic road safety rules)
	13. Harmonise, over time, the penalties for the main infringements of the rules of the road for international hauliers.	Encouraging road users to improve their behaviour (complying with basic road safety rules)
<b>DRIVING LICENCE</b>	14. Amend Directive 91/439/EEC on driving licences in order to introduce in particular minimum standards for car driving examiners and a staged driving licensing system for motorcyclists, trucks and bus drivers to reduce accident risks among inexperienced drivers.	Encouraging road users to improve their behaviour (driver licensing and training)
	15. Continue work on reviewing, in the light of scientific progress, minimum standards for physical and mental fitness to drive and study the impact of medical examinations on road safety.	Encouraging road users to improve their behaviour (driver licensing and training)

	MEASURES	RSAP AREA OF ACTION
	16. Work towards establishing a scientific approach to learning how to drive and to road safety training, from school age.	Encouraging road users to improve their behaviour (driver licensing and training)
	17. Continue specific work on young drivers and rehabilitation methods to reduce re-offending.	Encouraging road users to improve their behaviour (driver licensing and training)
<b>PASSIVE VEHICLE SAFETY</b>	18. Encourage the general use of crash helmets by all two-wheel motor vehicle users.	Encouraging road users to improve their behaviour (use of crash helmets)
	19. Study the effectiveness of crash helmet use by cyclists in different age groups, as well as the impact on bicycle use and the measures to be taken, where appropriate, at EU level.	Encouraging road users to improve their behaviour (use of crash helmets)
	20. The Commission will continue to support EuroNCAP to enable further progress to be made, to raise awareness among and inform consumers and to strengthen the representation of the Member States.	Making use of technical progress (consumer information)
	21. Develop a harmonised specification for the installation of audible or visual seat belt reminder systems and promote their universal use by voluntary agreement.	Making use of technical progress (accident protection or passive safety)
	22. Introduce universal anchorage systems for child restraint devices.	Making use of technical progress (accident protection or passive safety)
	23. Improve cars to reduce the severity of accidents involving pedestrians and cyclists.	Making use of technical progress (accident protection or passive safety)
	24. Study the causes of and ways of preventing whiplash injuries.	Making use of technical progress (accident protection or passive safety)
	25. Support the development of smart restraint systems.	Making use of technical progress (accident protection or passive safety)
	26. Adapt to technical progress the front, side and rear-end impact directives for lorries to limit vehicle under-run, and introduce energy absorption criteria.	Making use of technical progress (accident protection or passive safety)
	27. Make vehicles more compatible.	Making use of technical progress (accident protection or passive safety)
28. Examine the impact on road safety of the proliferation of 4 x 4s, sports utility vehicles and multi-purpose vehicles.	Making use of technical progress (accident protection or passive safety)	
<b>ACTIVE SAFETY OF VEHICLES</b>	29. Examine the wide-scale use of daytime running lights on all vehicles.	Making use of technical progress (accident prevention or active safety)
	30. Improve the visibility of heavy duty vehicles.	Making use of technical progress (accident prevention or active safety)
	31. Eliminate blind spots towards the rear for drivers of heavy duty vehicles.	Making use of technical progress (accident prevention or active safety)
	32. Assess measures to reduce tyre-related accidents.	Making use of technical progress (accident prevention or active safety)
	33. Examine driver impairment detection devices, e.g. alcohol ignition interlocks ("alcolocks") and driver fatigue detectors.	Making use of technical progress (accident prevention or active safety)
	34. Examine national trials of intelligent speed adaptation devices and assess their acceptability to the public.	Making use of technical progress (accident prevention or active safety)

	MEASURES	RSAP AREA OF ACTION
	35. Improved motorcycle safety through legislation or voluntary agreements with the industry.	Making use of technical progress (accident prevention or active safety)
	36. Examine the benefits of harmonising the approval of adaptations to vehicles for persons with reduced mobility.	Making use of technical progress (accident prevention or active safety)
	37. Adopt a long-term plan concerning information and communication systems in the field of road safety and establish the necessary regulatory framework for implementing such systems.	Making use of technical progress (accident prevention or active safety)
	38. Identify priority areas for the development and implementation of performance standards to optimise the man-machine interface and the road safety potential of telematic applications. Ensure compliance with the declaration of principles concerning the human-machine interface.	Making use of technical progress (accident prevention or active safety)
	39. Examine, together with the Member States, the need to include new onboard electronics systems in roadworthiness testing.	Making use of technical progress (periodic technical inspection)
	40. Determine and encourage best practices so as to improve the efficiency of periodic compulsory inspections at the lowest cost.	Making use of technical progress (periodic technical inspection)
<b>INFRASTRUCTURE</b>	41. Submit a proposal for a framework directive on road infrastructure safety with a view to introducing a system for the harmonised management of black spots and road safety audits for roads on the trans-European network.	Encouraging the improvement of road infrastructure
	42. Draw up technical guidelines concerning infrastructure, notably for low cost measures, audit methods, urban safety management, speed moderation techniques and forgiving roadsides.	Encouraging the improvement of road infrastructure
	43. Draw up good practice guidelines for level-crossing safety.	Encouraging the improvement of road infrastructure
	44. Assess the safety impact of projects receiving Community funding and concerning an entire area.	Encouraging the improvement of road infrastructure
	45. Adapt to technical progress the Community standards applicable to road equipment and ensure a high level of protection, notably by making road sides less hazardous in the event of an accident.	Encouraging the improvement of road infrastructure
	46. Carry out research and demonstration projects on 'intelligent roads'.	Encouraging the improvement of road infrastructure
	47. Achieve a high level of safety in tunnels, notably through standards and user information.	Encouraging the improvement of road infrastructure
<b>PROFESSIONAL DRIVERS</b>	48. Adoption and incorporation in national legislation of a European Parliament and Council directive on the training of commercial drivers.	Safe commercial goods and passenger transport
	49. Tighter legislation (and enforcement) of driving and rest periods for commercial road haulage.	Safe commercial goods and passenger transport
	50. Installation of digital tachographs in commercial vehicles.	Safe commercial goods and passenger transport
	51. Best practice guidelines concerning company policies.	Safe commercial goods and passenger transport

	MEASURES	RSAP AREA OF ACTION
	52. Best practice guidelines concerning the securing of loads and the carriage of exceptional loads.	Safe commercial goods and passenger transport
	53. Adapting to technical progress the Community legislation concerning the carriage of hazardous goods.	Safe commercial goods and passenger transport
	54. Making the wearing of seatbelts mandatory in coaches and heavy goods vehicles.	Safe commercial goods and passenger transport
	55. Introducing protection rules for vehicles regularly used for the carriage of children.	Safe commercial goods and passenger transport
	56. Examining the impact on road safety of the growing use of small commercial vehicles and company vehicles.	Safe commercial goods and passenger transport
ACCIDENTOLOGY	57. Examine best practice with regard to post-accident medical care.	Emergency services and care for road accident victims
	58. Draw up specifications for satellite-positioning accident-warning systems and carry out demonstration projects involving the whole chain of emergency service provision.	Emergency services and care for road accident victims
	59. Develop the CARE database and widen access to it, in the interest of achieving greater transparency and encouraging its use; expand CARE to include hazard exposure variables and the causes of accidents.	Accident data collection, analysis and dissemination
	60. Assess and improve systems for linking hospital data and national road accident statistics.	Accident data collection, analysis and dissemination
	61. Develop specifications for on-board accident recording devices, and examine the consequences of various alternatives for certain categories of vehicles.	Accident data collection, analysis and dissemination
	62. Establish a European methodology for independent road accident investigations and set up a group of independent experts meeting within the Commission.	Accident data collection, analysis and dissemination

## 1.2 Objectives

As stated above, the main objective of the ex-post evaluation is gaining a deep and precise understanding of the contents and targets of the measures covered by the current RSAP, in order to contribute to the preparation of the future European Road Safety Action Program (ERSAP) (2011-2020). This new programme, in fact, should be created keeping into consideration the lessons that can be learned from the previous experience.

The specific objective of the study is to examine if measures have been completed or only partially taken, and if they have been sufficiently effective. The reasons for potential shortcomings and their effects are also analysed.

The RSAP is now in its sixth year of implementation and this allows for an analysis of the impact on road safety. Valuable information related to the problems encountered with the implementation of

individual measures, future possibilities for the realisation of any target and the effectiveness of the proposed actions may be obtained.

In particular, the task will focus on the state of implementation and the impacts of the measures, and will look at the:

- *effectiveness*: what effects, in road safety-terms, have been obtained by the measures?
- *efficiency*: how economically have the various inputs been converted into outputs and results (cost-effectiveness)? Were the (expected) effects obtained at a reasonable cost (quantified cost/benefits analysis)?
- *consistency*: is the measure consistent with other measures that have the same or a comparable objective?
- *sustainability*: will the effects achieved last in the medium or long term?
- *negative effects from non-implementation*: what effects have resulted from the non-implementation of measures compared with the estimated effects of their implementation?

### 1.3 Methodology

The ex-post evaluation has been carried out following three methodological stages, which are as follows:

- overview of the current status-quo of the measures' implementation across the EU Member States, with the identification of the main issues, objectives and indicators;
- empirical ex-post evaluation of road safety measures;
- review of the impacts on road safety and identification of future challenges.

The research has been based on two main pillars. Firstly, a desk research has been performed, looking at the literature review and the available databases and case-studies. Secondly, information has been gathered via European associations, stakeholders, experts and national authorities by making use of questionnaires, phone calls and the workshops organized within the framework of the new ERSAP preparation. Finally, a regular exchange of information has been maintained with the European Commission, Directorate General for Energy and Transport (DG TREN).

The overview of each measure has levered on **three main dimensions**:

- **state of implementation**: description of the state of progress of the measure (no, low, medium, high advancement, completed). This refers to what extent the measure has achieved its proposed objectives, based on its scope (e.g. executing research, drafting a directive or having a directive applied) and according to the EU standpoint;
- **timing of the effects**: when the measure is expected to impact on road safety: in the short term (less than 2 years), in the medium term (between 2 and 5 years), or in the long term (more than 5 years). There may be measures that have produced effects since the very beginning (like for

example the awareness campaign against drunk driving), whilst other measures show their results on a longer timing;

- **type of impact:** the measures may differ in terms of the impacts they produce on road safety (direct or indirect impact).

Moreover, the **consistency** between measures has been analysed such in a way to highlight the combined effects of different actions addressing the same issue.

The analysis has then identified the concrete outcomes derived from the measure implementation. For example, these can be conclusions of research activities, recommendations from thematic projects, guidelines or the adoption of a legislative act or a technical specification.

On the basis of this background information, the **effectiveness, efficiency and sustainability** of the measures are evaluated by attributing to each indicator a “high”, “medium” or “low” score.

Since the RSAP measures are very heterogeneous, not only as far as their nature is concerned but also in terms of level of implementation, each measure is analysed according to its specific characteristics, so to make sure that the best evaluation approach is chosen. This implies the employment of more than one technique.

A comprehensive quantitative ex-post evaluation is not always applicable to each measure, hence a qualitative evaluation is undertaken. This is the case when the impact of the measures on road safety is indirect and therefore not computable in terms of road fatalities. For example, research activities do not impact safety directly, nor does building a database or identifying best practices. In addition, some of the measures only have an effect outside the period 2001-2010: in this case the analysis considers if the measures already provides the basis for a positive impact in road safety or further action is needed at the EU level (for example, a Directive has been approved, but it is still waiting to be enforced).

In this respect, significant data limitations also need to be considered. Sometimes measures can have a direct impact on road safety, but there are no data for the specific target group or there are only data referring to one time period, making impossible an evaluation of the effects over time.

The fact that measures (and therefore the approaches adopted in the analysis) are not homogeneous implies that a comparison across the scores attributed to the different measures is not feasible. The evaluation, in fact, leads to a rating of the impact for each RSAP measures (“the success of their implementation”), rather than a ranking of the measures themselves.

As a result of the evaluation process, all the variables (efficiency, effectiveness, sustainability) contribute to form a **summary indicator** which classifies the measures into four main groups:

- **no result**, when the measure has not contributed or has negatively contributed either to the reduction of road fatalities or to the mitigation of the effects of accidents;



- **low result**, when the measure has only slightly contributed to the reduction of road fatalities or to the mitigation of the effects of accidents;
- **medium result**, when the measure has well contributed to the reduction of road fatalities or to the mitigation of the effects of accidents;
- **high result**, when the measure has strongly contributed to the reduction of road fatalities or to the mitigation of the effects of accidents.

This summary indicator takes into account the state of implementation and the concrete outcomes achieved in the framework of the measure. It is evaluated if the state of implementation of the measures already embed the basis for a positive impact in road safety, irrespective from the time horizon during which the impacts are produced. The timing of the effects do not affect directly this judgement, but it is indirectly taken into account in the efficiency score, where the costs are put in relation with the benefits: for example, if the impact is expected only in the long term, the efficiency tends to be lower as the benefits will be achieved later, while the costs are sustained in the short period.

As mentioned before, since the measures vary considerably in scope, stringency and directness of the effects, the result indicator is also not comparable over measures.

The analysis of each individual measure, together with the detailed description of the measures and of their level of implementation, is provided in Annex 1.2, while the key outputs of the analysis are presented in Chapter 3.

However, measures have been evaluated not only individually, but also at the aggregate level. Namely, the ex-post evaluation has been conducted by making a problem analysis to link the measure to the target group. The measures that share the same specific objective were grouped in order to avoid any duplication of the analysis, and to take into account both synergies and combined impacts of the different actions (see Chapter 4).

## **1.4 Statistical sources**

The CARE database, which is the European database on road accidents resulting in death or injury, has represented the main source of statistical data used for the analysis of Task 1. Most of the data refers to the year 2008, but the latest estimates for the fatalities in 2009 have been included in the analysis. Some data with a higher disaggregation level are available only for previous years and for only part of the EU member States.

The CARE data have been integrated with more specific data collected within:

- the European Truck Accident Causation Study (ETAC), launched in 2004 to set up a heavy goods vehicle accident causation study, and

- the Motorcycle Accident In-Depth Study (MAIDS), whose purpose was the identification of the causation factors of motorcycle accidents focusing on injury prevention, motorcycle improvements, and a better understanding of the human factor.

Furthermore, additional data concerning fatalities per vehicle-km have been taken by the International Road Traffic and Accident Database (IRTAD), which has been established within the Road Transport Research Programme of the Organisation for Economic Cooperation and Development (OECD) with the goal of collecting accident and traffic data and other safety indicators for 29 countries<sup>7</sup>.

The Statistical Office of the European Communities database, EUROSTAT, has been used to gather general data, such as the European population or the characteristics of the European vehicle fleets, in order to assess the road traffic risk exposure.

Finally, the SafetyNet website is used as it provides road safety performance indicators for specific issues, such as alcohol, speed, protection systems, trauma management and daytime running lights.

## **1.5 Structure of the report**

The Section is divided into two major parts: the first presents an overview of the objectives, activities and methodology of the study, while the second part illustrates the ex-post evaluation and its major findings, integrating the results of the stakeholders consultation. In particular, after this introduction:

- **Chapter 2** describes the major findings of the stakeholders' consultation;
- **Chapter 3** provides an overview of the analysis carried out for each individual measure and its main results;
- **Chapter 4** illustrates the evaluation exercise at the aggregate level. First, general data regarding road safety in Europe are presented and discussed in respect of the objective of halving the number of road fatalities by 2010; then, the ex-post evaluation is described for the different groups of measures aggregated by scope;
- **Chapter 5**, finally, presents the major findings of the study and highlights the future challenges to be addressed in the framework of the new ERSAP.

In annex:

- **Annex 1.1** includes the list of the contacted stakeholders and the models for the questionnaires for both private European Organisation and National Authorities.

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<sup>7</sup> Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, Netherlands, New Zealand, Norway, Poland, Portugal, Slovenia, Spain, Sweden, Switzerland, United Kingdom, USA.

- **Annex 1.2** contains the factsheets of each of the 62 measures of the RSAP, which describe the objective of the area of intervention, the level of implementation and the evaluation of the outcomes.

## 2 Stakeholder consultation on RSAP

In order to collect relevant opinions and feedbacks with regard to the measures covered by the current RSAP, a stakeholder consultation has been undertaken. This exercise looks specifically at the ex-post evaluation of the RSAP measures and their impacts, hence differing from the public consultation<sup>8</sup> which instead focused on the next ERSAP 2011-2020.

Stakeholders may be defined as institutions or organisations (public or private) that may present a specific and significant interest in a project (implementers, facilitators, beneficiaries or adversaries). In particular, the following target groups have been addressed:

- Representatives of national enforcement bodies and police;
- Representatives of road users;
- European umbrella membership organisations of the automotive sector;
- European umbrella membership organisations of motorcycle manufacturers;
- Representatives of the road infrastructure sector;
- Representatives of non-governmental organisations active in the field of road safety;
- National Authorities of the 27 EU Member States (plus Norway, Iceland and Switzerland) having a responsibility and an interest in the domain of road transport.

The activities that have been pursued during the course of the stakeholder consultation may be summarised as follows:

- identifying the general scope of the specific RSAP measures being considered and the most relevant subjects in the different fields of action;
- contacting those groups that could have a significant interest in the RSAP programme and its ex-post evaluation;
- interpreting the findings of the analysis.

The complete list of the contacted stakeholders, with the related road safety measures of interest, and the questionnaire which has been designed as guideline during the consultation and presented in Annex 1.1. Importantly, the questionnaire has been prepared into two distinct versions, i.e. one for the European stakeholders, and one for the National Authorities of the EU Member States.

The following section presents a summary of the major findings resulting from the stakeholder contribution, detailing the most relevant and significant comments received by the respondents according to the various categories in which the road safety measures have been grouped.

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<sup>8</sup> Consisting of six thematic workshops, a stakeholder meeting and an internet consultation.

## 2.1 Major findings

In total, 24 replies have been received: 12 have been provided by private stakeholders (out of 24 selected) and 12 by national authorities (out of 30). Regarding the former, at least one European stakeholder for each RSAP area of action has actively participated to the consultation. Regarding the latter, a good representativeness of EU countries has been assured, by having received answers from both old and new Member States, from big and small countries and from countries with a good and poor performance in road safety.

The following main findings may be deducted from the stakeholder consultation:

- Globally, the measures have been positively evaluated by the stakeholders. Namely, the setting of the target of a 50% reduction of road victims emerges as the one that proved to be the most effective and sustainable in the long-term. In summary, the current RSAP has enabled to promote a better understanding of the road safety challenges; many of these actions shall be taken further (infrastructure safety, road safety statistics, eSafety, enforcement among others).
- The majority of the stakeholders (about 46% of the respondents) considers the RSAP impact on road safety as “high”, at least potentially.
- The stakeholders were asked to indicate, based on their experience, the most successful measures in helping to reduce casualties. Their replies are summarised as follows:
  - Engineering<sup>9</sup> (71% of respondents);
  - Vehicle design improvements (54% of respondents);
  - Education and training initiatives (54% of respondents);
  - Public awareness (54% of respondents);
  - Enforcement (42% of respondents);
  - Local safety schemes (42% of respondents);
  - Better pedestrian facilities (42% of respondents);
  - Highlighting hazards (25% of respondents).
- Exchange of best practices, promotion and coordination of research are areas where the European Union shall secure its policy and financial support in the new RSAP as well.
- Many stakeholders, on the other hand, rate the RSAP impact as “medium” (about 33% of the respondents). They acknowledge the important support and the proactive nature of the RSAP measures in terms of research projects towards a better understanding of accident factors or

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<sup>9</sup> In this case, engineering refers to measures at accident “hot” spots, such as new junction layouts, anti skid surfacing, new lighting, speed humps, traffic calming, etc.

support to training and awareness schemes, but highlight the lack of effective implementation in the Member States as a primary reason of concern.

- When the impact is rated as “low” (about 17% of the respondents), this is motivated with a lack of strategy and investments behind the general target of saving 25,000 lives by 2010. Member States are missing specific and differentiated instructions for their specific and different situations, and this would explain why Europe is not reaching the expected results. Moreover investments appear to be inadequate and insufficient in relation to the ambitious target.
- Significantly, replies from National Authorities highlights that the impacts are important to the extent that the RSAP feeds the road safety dynamics at national level. Among the stakeholders, it may be interesting to point out that the National Authorities have more often responded “medium”, while the private sector has rather expressed a strong impact. Importantly, the majority of those Member States that rated the impact of the RSAP as “high” are new Member States. This underlines the fact that the coordination and support secured by the EC has played a major role in helping those countries to fill the gap with the old Member States in terms of road safety.
- The majority (83%) of the stakeholders has argued that, compared with the current RSAP, a greater number (or at least the same amount) of safety measures shall be included into the new RSAP. In this respect, according to the stakeholders a balance shall be secured between quantity and quality of the road safety measures. Indeed, the key issue is the impact these measure may have, where too many measures may lead to difficulties with evidence based evaluation, resources redistribution and responsibility attribution.
- In terms of cost-effectiveness, the efficiency of the financial resources allocated for road safety has been evaluated differently, depending on the various fields of actions. For instance, the evaluation is positive when referring to road infrastructure, while it is more critical when observing the (limited) resources not effectively used for evidence-based policy making.
- The issue of setting a “target” for further reducing road victims is seen as crucial for all stakeholders. They all stress the need to keep on including targets into the new programme, since they are considered to be the most efficient and measurable tool for committing Member States to the reduction of road casualties and injuries. Setting a target for fatality reduction made a great contribution within the framework of the current RSAP to the improvement of road safety. This is also confirmed by the importance attributed to the performance indicators at EU and national levels, which are seen as a prerequisite for effective evidence-based policy making, though some indicators were missing and other not updated regularly.
- Furthermore, accurate accident data and figures are still lacking, making a comprehensive assessment difficult. Harmonisation of accident reporting procedures also emerges as key

issues. Member States shall report road safety statistics in a more harmonised and detailed way, so to facilitate a better degree of analysis and comparison.

- The measures on passive vehicle safety, together with those on active vehicle safety and infrastructure, have been the object of several comments and considerations from the consulted stakeholders. Generally, their degree of implementation and relevance of effects have been graded high by the various stakeholders.
- Concerning technological innovation and development, significant effects in the future will be possible only if the technology will be: transparent, reliable, cheap, comfortable, generally acceptable and not easy to circumvent or manipulate.
- Some stakeholders stressed the importance of traffic calming measures in relation not only to traffic safety, but also to environmental performance, even if this action was not included among the measures of the RSAP.

A possible limitation of the outcomes of the stakeholders consultation is that some replies are more likely to be biased because of the respondents' direct interest in this field (e.g. the need of more funds).

Besides the general findings that have been illustrated in this section, the consulted stakeholders have provided more specific comments and views on those road safety measures that were more relevant for their respective fields of activities. Such comments are presented in the chapter 4 (ex-post evaluation of RSAP), incorporated in the Sections addressing homogeneous groups of measures (see boxes).

### 3 Overview and analysis of the RSAP measures

In order to provide complete information and to prepare and support the ex-post evaluation in aggregated terms, an analysis of **each individual measure** was carried out. Every measure has been presented looking at its objectives, its state of implementation and its achieved results, evaluating the level of effectiveness, efficiency and sustainability of the activities carried out. The following Table illustrates the model scheme adopted for this exercise.

*Table 2: Template for measure description and evaluation*

<p><b>Measure</b></p> <ul style="list-style-type: none"> <li>- <i>Short description (objective, scope and actors involved)</i></li> <li>- <i>Classification (EU - National - Local initiative / Thematic study or project / Norm / Technical specification / Statistics / Best practice)</i></li> </ul> <p><b>State of implementation</b></p> <ul style="list-style-type: none"> <li>- <i>No (definitive / temporary suspended) / Low / Medium / High advancement / Completed (and description of state of the progress)</i></li> </ul> <p><b>Impact on road safety</b></p> <ul style="list-style-type: none"> <li>- <i>Type of impact (direct / indirect)</i></li> <li>- <i>Timing of the effects (Short, Medium, Long term)</i></li> <li>- <i>Consistency with other measures</i></li> </ul> <p><b>Ex-post evaluation</b></p> <ul style="list-style-type: none"> <li>- <i>Outcomes / Effectiveness / Efficiency (incl. Cost-Benefit) / Sustainability / Effects of implementation or non implementation, as far as possible quantified</i></li> </ul> <p><b>Results</b></p> <ul style="list-style-type: none"> <li>- <i>Description of the impact</i></li> <li>- <i>Contribution to road safety (No / Low / Medium / High results)</i></li> <li>- <i>What remains to be done (ERSAP 2011-2020)</i></li> </ul> <p><b>Sources</b></p>
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The factsheets of the individual measures with all the complete information including a description of the actions, projects, initiatives and research carried out since 2001 are provided in Annex 1.2, while the key outputs of the analysis are presented in a more concise way in the table below.

As previously mentioned in Chapter 1.3, measures vary considerably in scope, stringency and directness of the effects and hence the result indicators are not comparable by their scores. The evaluation, in fact, leads to a rating of the impact for each RSAP measures, rather than a ranking of the measures themselves.

As it may be noticed, the first measure, which set the general objective of “reducing the number of road deaths by 50% by 2010”, is not included in this analysis, but it is approached individually in Sections 4.1 in a more exhaustive way because of its peculiar nature.



*Table 3: Summary of the measure evaluation*

Measure	Classification	State of implementation	Timing of the effects	Type of impact	Ex post evaluation			Results
					Effectiveness	Efficiency	Sustainability	
<b>GENERALS</b>								
2. Evaluate the progress made, compared with the target, by means of appropriate performance indicators at Community and national levels.	Statistics	Medium advancement	Long term	Indirect	High	Medium	High	High
3. Provide a report in 2005 on monitoring of the target, action carried out and modifications needed as a result of enlargement and, where appropriate, propose new measures.	Thematic study / EU initiative	Completed	Short and medium term	Indirect	Not computable	Not computable	Not computable	Medium
4. Invite all parties concerned to sign a European Road Safety Charter.	EU initiative	Medium advancement	Short, medium and long term	Indirect	Medium	Medium	Medium	Medium

**Table 3: Summary of the measure evaluation (continued)**

Measure	Classification	State of implementation	Timing of the effects	Type of impact	Ex post evaluation			Results
					Effectiveness	Efficiency	Sustainability	
5. Propose the introduction of harmonised road safety criteria in public service contracts.	Technical specification	Low advancement	Medium term	Indirect	Not computable	Not computable	Not computable	Medium
6. Study, together with the European haulage industry, additional measures which insurers could take to pass the cost of accident risks on more directly.	Thematic study	Medium advancement	Short term	Indirect	Medium	Medium	High	Medium
7. Set up a European road safety observatory within the Commission.	EU initiative	Completed	Long term	Indirect	Medium	High	High	Medium
<b>USERS' BEHAVIOUR</b>								
8. Propose measures to strengthen checks and ensure the proper enforcement of the most important safety rules.	EU norm	Medium advancement	Short term	Indirect	High	Medium	Low	High
9. Develop best practice guidelines as regards police checks.	Thematic project	Completed	Medium term	Indirect	Medium	Medium	High	Medium
10. Collect, compare and publish information on national highway codes, and on infringements established and penalties imposed in the various countries.	Thematic study	High advancement	Short term	Indirect	Not computable	Not computable	Medium	Low

*Table 3: Summary of the measure evaluation (continued)*

Measure	Classification	State of implementation	Timing of the effects	Type of impact	Ex post evaluation			Results
					Effectiveness	Efficiency	Sustainability	
11. Participate in awareness campaigns about drinking and driving, seat belts, speed and fatigue, if possible combined with national police activities.	Thematic project / EU initiative	High advancement	Short and medium term	Indirect	High	Medium	Medium	High
12. Encourage the application of the recommendation on the blood alcohol limit; continue work on the effects of drugs and medicines; establish appropriate classification and labelling of medicines which affect driving ability.	Research project	Low advancement	Short term: application of blood alcohol limits. Long term: research on effects of drug and medicines supporting policy-making.	Direct: application of blood alcohol limits. Indirect: research on effects of drug and medicines supporting policy-making.	Application of blood alcohol limits: high Research on effects of drug and medicines supporting policy-making: not computable.	Low	High	High
13. Harmonise, over time, the penalties for the main infringements of the rules of the road for international hauliers.	EU norms	Low advancement	Medium term	Indirect	Not computable	Not computable	High	Low

Table 3: Summary of the measure evaluation (continued)

Measure	Classification	State of implementation	Timing of the effects	Type of impact	Ex post evaluation			Results
					Effectiveness	Efficiency	Sustainability	
<b>DRIVING LICENSE</b>								
14. Amend Directive 91/439/EEC on driving licences in order to introduce in particular minimum standards for car driving examiners and a staged driving licensing system for motorcyclists, trucks- and bus drivers to reduce accident risks among inexperienced drivers	EU norm	Completed	Long term	Indirect	High	Medium	High	High
15. Continue work on reviewing, in the light of scientific progress, minimum standards for physical and mental fitness to drive and study the impact of medical examinations on road safety.	Thematic study / EU norm	Complete	Medium term	Indirect	Not computable	Not computable	High	Low
16. Work towards establishing a scientific approach to learning how to drive and to road safety training, from school age.	Thematic study	High advancement	Medium and long term	Indirect	High	Medium	High	High

*Table 3: Summary of the measure evaluation (continued)*

Measure	Classification	State of implementation	Timing of the effects	Type of impact	Ex post evaluation			Results
					Effectiveness	Efficiency	Sustainability	
17. Continue specific work on young drivers and rehabilitation methods to reduce re-offending.	EU norm / initiative	Medium advancement	Short term	Indirect	Not computable	Not computable	High	Medium
<b><i>PASSIVE VEHICLE SAFETY</i></b>								
18. Encourage the general use of crash helmets by all two-wheel motor vehicle users.	EU and private initiative	Medium advancement	Short term	Direct	High	High	Medium	High
19. Study the effectiveness of crash helmet use by cyclists in different age groups, as well as the impact on bicycle use and the measures to be taken, where appropriate, at EU level.	Thematic study	Temporary suspended	Long term	Indirect	Not computable	Not computable	Not computable	No results
20. The Commission will continue to support EuroNCAP to enable further progress to be made, to raise awareness among and inform consumers and to strengthen the representation of the Member States.	Thematic project / Technical specification	High advancement	Medium term	Indirect	High	High	High	High

**Table 3: Summary of the measure evaluation (continued)**

Measure	Classification	State of implementation	Timing of the effects	Type of impact	Ex post evaluation			Results
					Effectiveness	Efficiency	Sustainability	
21. Develop a harmonised specification for the installation of audible or visual seat belt reminder systems and promote their universal use by voluntary agreement.	EU norm/ Technical specification	Medium advancement	Medium term	Direct	High	High	High	High
22. Introduce universal anchorage systems for child restraint devices.	Technical specification	Low advancement	Medium term	Direct	High	High	High	Medium
23. Improve cars to reduce the severity of accidents involving pedestrians and cyclists.	Technical specification / EU norm	Medium advancement	Medium term	Direct	Medium	Not computable	Medium	High
24. Study the causes of and ways of preventing whiplash injuries.	Thematic study	Medium advancement	Medium term	Indirect	High	Medium	High	Medium
25. Support the development of smart restraint systems.	Thematic study / Technical specification	Medium advancement	Medium term	Indirect	High	Medium	High	Medium
26. Adapt to technical progress the front, side and rear-end impact directives for lorries to limit vehicle under-run, and introduce energy absorption criteria.	Technical specification	Low advancement	Short term	Direct	Medium	Low	Medium	Medium

Table 3: Summary of the measure evaluation (continued)

Measure	Classification	State of implementation	Timing of the effects	Type of impact	Ex post evaluation			Results
					Effectiveness	Efficiency	Sustainability	
27. Make vehicles more compatible.	Technical specification	Low advancement	Medium term	Direct	High	Medium	High	High
28. Examine the impact on road safety of the proliferation of 4x4s, sports utility vehicles and multi-purpose vehicles.	Thematic study	High advancement	Medium term	Indirect	Medium	Medium	Medium	Low
<b>ACTIVE SAFETY OF VEHICLES</b>								
29. Examine the wide-scale use of daytime running lights on all vehicles.	Thematic study / EU norm	High advancement	Medium term	Indirect	Medium	Medium	High	Medium
30. Improve the visibility of heavy duty vehicles.	EU norm / Project	Completed	Medium term	Direct	Medium	High	High	Medium
31. Eliminate blind spots towards the rear for drivers of heavy duty vehicles.	Technical specification	Completed	Short term	Direct	Medium	High	High	Medium
32. Assess measures to reduce tyre-related accidents	EU initiative / Project	Medium advancement	Medium term	Indirect	High	High	Medium	No results
33. Examine driver impairment detection devices, e.g. alcohol ignition interlocks ('alcolocks') and driver fatigue detectors.	Thematic study	Low advancement	Medium term	Indirect	Low	Medium	Medium	No results

*Table 3: Summary of the measure evaluation (continued)*

Measure	Classification	State of implementation	Timing of the effects	Type of impact	Ex post evaluation			Results
					Effectiveness	Efficiency	Sustainability	
34. Examine national trials of intelligent speed adaptation devices and assess their acceptability to the public.	Thematic study	High advancement	Medium and long term	Indirect	High	High	Medium	High
35. Improved motorcycle safety through legislation or voluntary agreements with the industry.	EU initiatives / Project	Medium advancement	Medium term	Direct	Not computable	Not computable	Medium	Low
36. Examine the benefits of harmonising the approval of adaptations to vehicles for persons with reduced mobility.	Thematic study	Low advancement	Medium term	Indirect	Low	Low	Medium	Low
37. Adopt a long-term plan concerning information and communication systems in the field of road safety and establish the necessary regulatory framework for implementing such systems.	EU initiative / Project	Medium advancement	Long term	Indirect	High	High	High	High



Table 3: Summary of the measure evaluation (continued)

Measure	Classification	State of implementation	Timing of the effects	Type of impact	Ex post evaluation			Results
					Effectiveness	Efficiency	Sustainability	
38. Identify priority areas for the development and implementation of performance standards to optimise the man-machine interface and the road safety potential of telematic applications. Ensure compliance with the declaration of principles concerning the human-machine interface.	Project	Medium advancement	Medium term	Indirect	High	Medium	Medium	Medium
39. Examine, together with the Member States, the need to include new onboard electronics systems in roadworthiness testing.	Thematic study	Medium advancement	Medium term	Indirect	Not computable	Medium	Medium	Low
40. Determine and encourage best practices so as to improve the efficiency of periodic compulsory inspections at the lowest cost.	Best practice	Medium advancement	Medium term	Indirect	Medium	Medium	Medium	Medium

*Table 3: Summary of the measure evaluation (continued)*

Measure	Classification	State of implementation	Timing of the effects	Type of impact	Ex post evaluation			Results
					Effectiveness	Efficiency	Sustainability	
<b>INFRASTRUCTURE</b>								
41. Submit a proposal for a framework directive on road infrastructure safety with a view to introducing a system for the harmonised management of black spots and road safety audits for roads on the trans-European network.	EU norm	Completed	Medium term	Indirect	High	Medium	High	High
42. Draw up technical guidelines concerning infrastructure, notably for low cost measures, audit methods, urban safety management, speed moderation techniques and forgiving roadsides.	Thematic project	Medium advancement	Long term	Indirect	High	Medium	Medium	Medium
43. Draw up good practice guidelines for level-crossing safety.	Thematic study / Project	Low advancement	Long term	Indirect	Medium	Medium	Medium	Medium
44. Assess the safety impact of projects receiving Community funding and concerning an entire area.	Technical specification	Low advancement	Medium and long term	Indirect	Not computable	Not computable	Low	Medium

*Table 3: Summary of the measure evaluation (continued)*

Measure	Classification	State of implementation	Timing of the effects	Type of impact	Ex post evaluation			Results
					Effectiveness	Efficiency	Sustainability	
45. Adapt to technical progress the Community standards applicable to road equipment and ensure a high level of protection, notably by making road sides less hazardous in the event of an accident.	Thematic study	Low advancement	Long term	Indirect	High	Medium	High	High
46. Carry out research and demonstration projects on 'intelligent roads'.	Projects	Medium advancement	Long term	Indirect	High	Medium	High	High
47. Achieve a high level of safety in tunnels, notably through standards and user information.	Projects / EU norms	High advancement	Medium term	Indirect	High	High	High	High
<b>PROFESSIONAL DRIVERS</b>								
48. Adoption and incorporation in national legislation of a European Parliament and Council directive on the training of commercial drivers.	EU norm	Completed	Medium term	Indirect	Medium	Medium	High	Medium
49. Tighter legislation (and enforcement) of driving and rest periods for commercial road haulage.	EU norm	Medium advancement	Short term	Indirect	Medium	Low	Medium	High

**Table 3: Summary of the measure evaluation (continued)**

Measure	Classification	State of implementation	Timing of the effects	Type of impact	Ex post evaluation			Results
					Effectiveness	Efficiency	Sustainability	
50. Installation of digital tachographs in commercial vehicles.	Technical specification	Completed	Short term	Indirect	Medium	Medium	Medium	High
51. Best practice guidelines concerning company policies	Best practice	Low advancement	Medium term	Indirect	Low	Medium	High	Low
52. Best practice guidelines concerning the securing of loads and the carriage of exceptional loads.	Best practice	Completed	Medium and long term	Indirect	Medium	Medium	High	Medium
53. Adapting to technical progress the Community legislation concerning the carriage of hazardous goods.	EU norm	Completed	Medium term	Indirect	Not computable	Not computable	High	Medium
54. Making the wearing of seatbelts mandatory in coaches and heavy goods vehicles.	EU norm	Completed	Short term	Direct	Not computable	Medium	High	Medium
55. Introducing protection rules for vehicles regularly used for the carriage of children.	Thematic and research projects	Medium advancement	Medium term	Direct	High	Medium	Medium	Medium
56. Examining the impact on road safety of the growing use of small commercial vehicles and company vehicles.	Thematic study	Completed	Long term	Indirect	Medium	Medium	Medium	Medium

*Table 3: Summary of the measure evaluation (continued)*

Measure	Classification	State of implementation	Timing of the effects	Type of impact	Ex post evaluation			Results
					Effectiveness	Efficiency	Sustainability	
<b>ACCIDENTOLOGY</b>								
57. Examine best practice with regard to post-accident medical care.	Thematic study	Completed	Medium Term	Indirect	High	High	Medium	High
58. Draw up specifications for satellite-positioning accident-warning systems and carry out demonstration projects involving the whole chain of emergency service provision	Thematic study	Completed	Medium Term	Indirect	High	High	High	High
59. Develop the CARE database and widen access to it, in the interest of achieving greater transparency and encouraging its use; expand CARE to include hazard exposure variables and the causes of accidents.	Statistics	Medium advancement	Short, medium and long term	Indirect	Medium	High	High	High
60. Assess and improve systems for linking hospital data and national road accident statistics.	Statistics	Medium advancement	Medium term	Indirect	Medium	High	High	Medium

*Table 3: Summary of the measure evaluation (continued)*

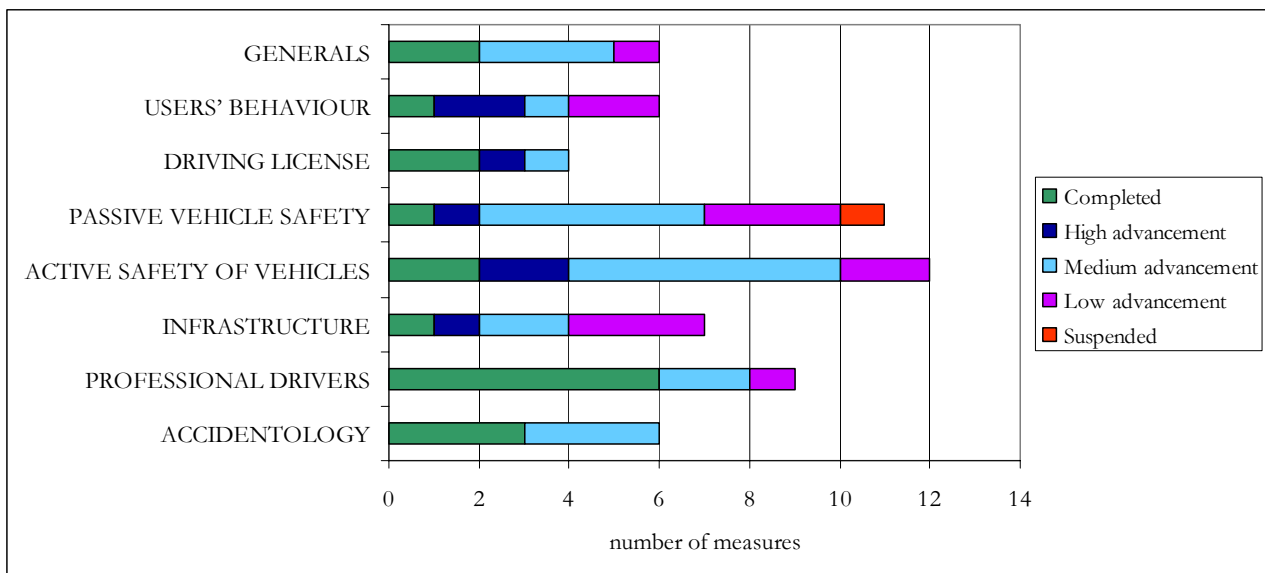
Measure	Classification	State of implementation	Timing of the effects	Type of impact	Ex post evaluation			Results
					Effectiveness	Efficiency	Sustainability	
61. Develop specifications for on-board accident recording devices, and examine the consequences of various alternatives for certain categories of vehicles.	Thematic study	Medium advancement	Medium term	Indirect	Medium	Medium	Medium	Medium
62. Establish a European methodology for independent road accident investigations and set up a group of independent experts meeting within the Commission.	Thematic study	Completed	Medium term	Indirect	Not computable	Not computable	High	Low

The following Figures illustrate the information contained in the Table above grouped by measures' category, showing the conclusions, for each of the 62 RSAP measures, of the ex-post evaluation concerning state of implementation, effectiveness, efficiency, sustainability and the results that the measures produced in terms of road safety.

It may be assumed that, overall, the actions carried out in the framework of the RSAP have had a positive impact. Only twelve measures produced low results or none (less than 20% of the total), while all the remaining measures have been evaluated as having a “high” (36%) or “medium” (44%) impact.

The state of implementation (illustrated in the Figure below) is, overall, quite high: only 12 measure present a low advancement, while one has been temporary suspended.

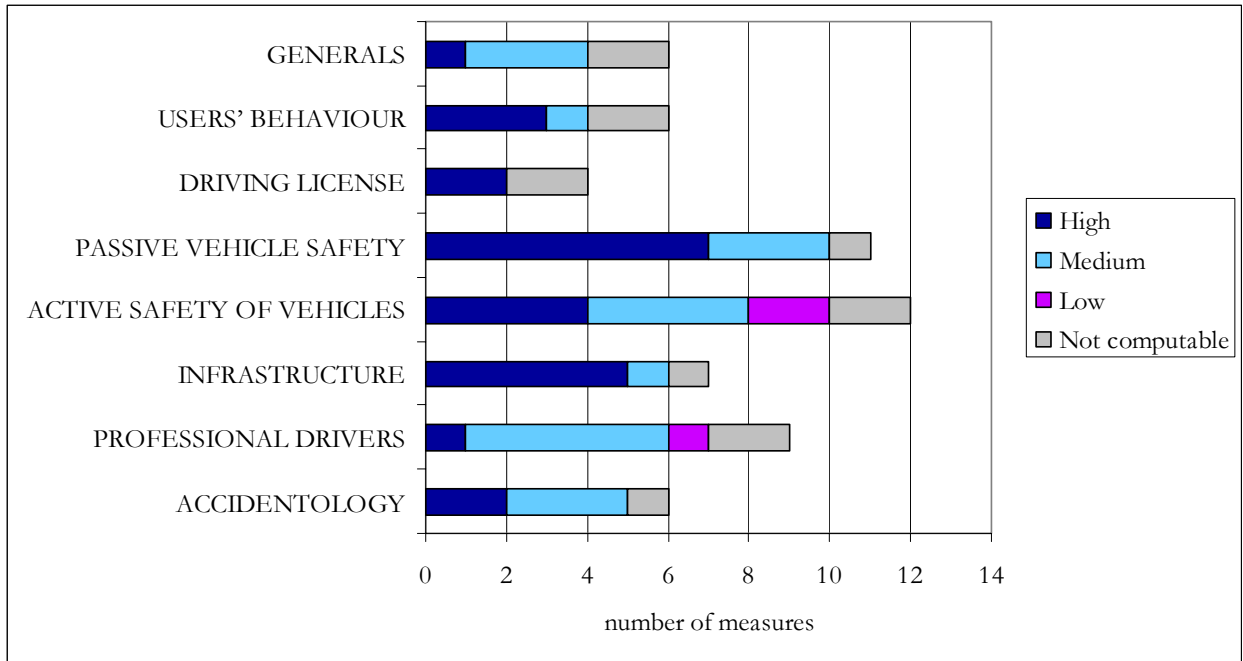
**Figure 1: Measures for each category classified by state of implementation**



*Source: TRT elaboration*

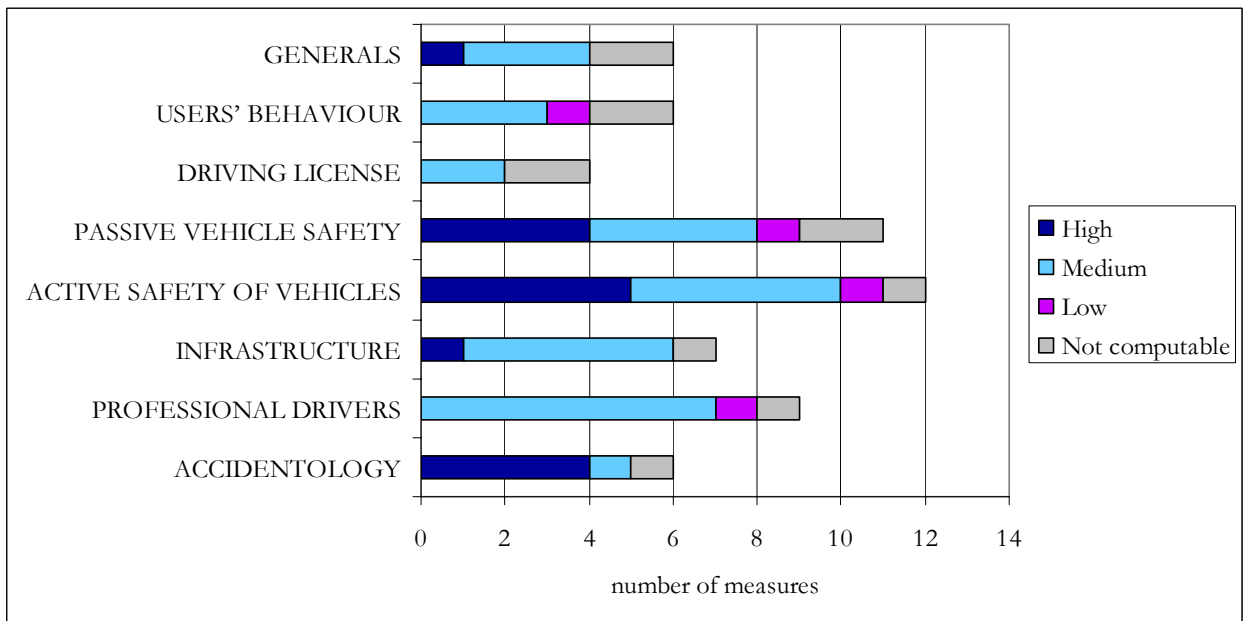
Also effectiveness, efficiency and sustainability are generally estimated as medium or high, while only few actions present a low rating. In some cases (particularly for what concerns efficiency and effectiveness), these features are labelled as “not computable” due to the lack of specific data or relevant information for the evaluation.

**Figure 2: Measures for each category classified by effectiveness**



Source: TRT elaboration

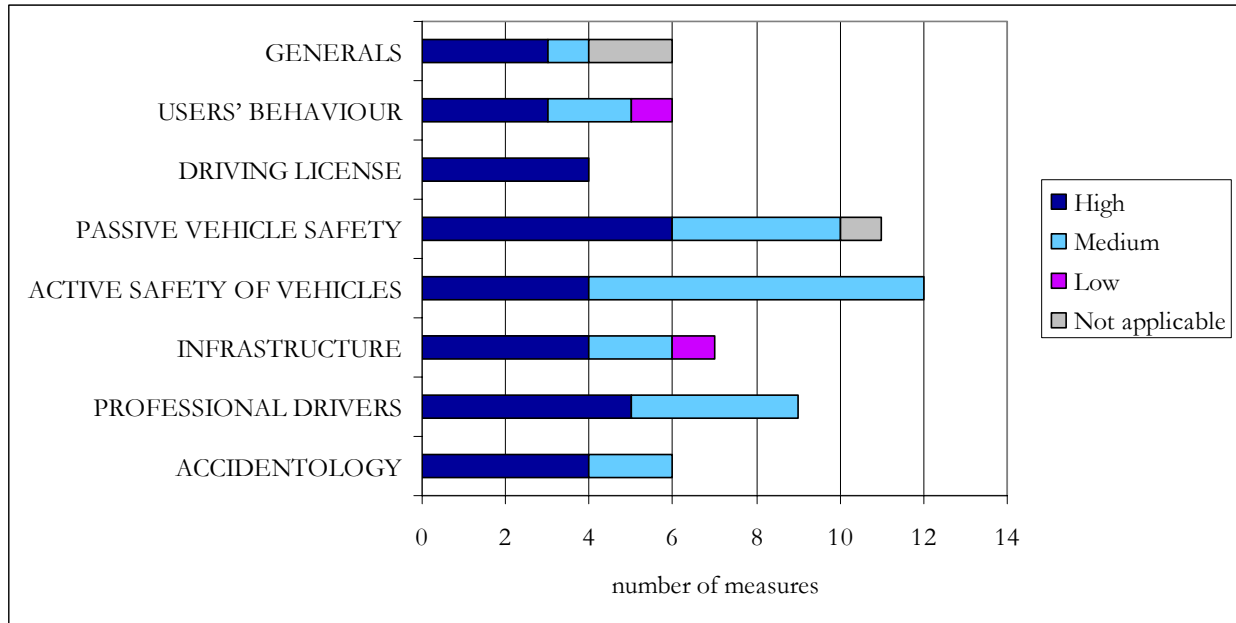
**Figure 3: Measures for each category classified by efficiency**



Source: TRT elaboration

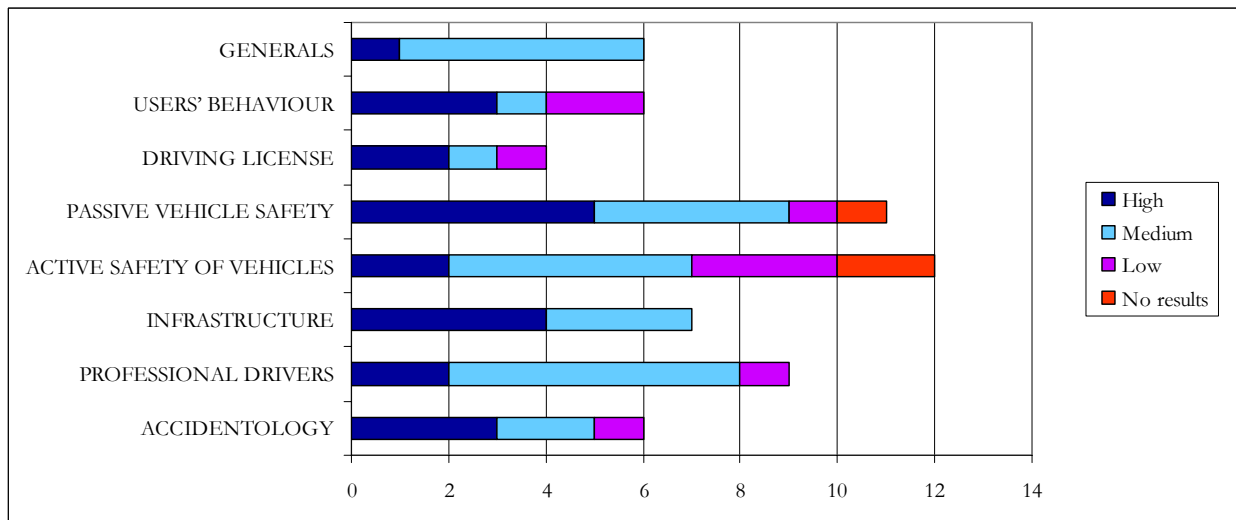


Figure 4: Measures for each category classified by sustainability



Source: TRT elaboration

Figure 5: Measures for each category classified by results



Source: TRT elaboration

Finally, the Table 4 below provides the numbers and the percentages summarising the rating of the RSAP measures for effectiveness, efficiency, sustainability and results.

*Table 4: Summary of the measure evaluation at aggregate level*

	<b>High</b>	<b>Medium</b>	<b>Low</b>	<b>No results</b>	<b>Not computable</b>
<b>Absolute number</b>					
Effectiveness	25	20	3	0	13
Efficiency	15	30	4	0	12
Sustainability	33	23	2	0	3
Results	22	27	9	3	0
<b>Percentage</b>					
Effectiveness	41,0%	32,8%	4,9%	0,0%	21,3%
Efficiency	24,6%	49,2%	6,6%	0,0%	19,7%
Sustainability	54,1%	37,7%	3,3%	0,0%	4,9%
Results	36,1%	44,3%	14,8%	4,9%	0,0%

*Source: TRT elaboration*

## 4 Ex-post evaluation of RSAP

This Section of the study addresses the ex-post evaluation of the RSAP impact on road safety.

The first chapter provides an overview of the state of the art of road safety in the EU, presenting all the relevant data to assess the achievements with respect to the objective of halving road fatalities by 2010.

This is followed by the exercise of evaluating the different RSAP measures aggregated by homogeneous targets or areas of action. More detailed data are provided, where available, together with a brief presentation of the stakeholders comments relative to the specific category of actions.

Finally, chapter 4.12 describes a cross-sectional analysis of the research activities and thematic studies funded by the European Commission in the different areas of road safety.

### 4.1 *Context: road safety in the European Union*

The following two Sections present the available data concerning road fatalities, injuries and accidents, in order to provide a complete overview of the risks faced by the European citizens in road traffic. The analysis is carried out taking as reference point the target set in the current RSAP.

#### 4.1.1 **The target of reducing the number of road accident victims**

The **first measure** of the RSAP sets the ambitious objective of halving the number of European road deaths by 2010. Translated in numbers, that means reducing road fatalities in the EU27 from about 54,300 per year in 2001 to about 27,150 in 2010.

Looking at the latest available data, it emerges that the goal seems unlikely to be reached. Even if the fatalities have been steadily declining since 2001, in 2008 the number of European traffic accident related deaths was reduced on average by about 28% only. In 2001, about 54,300 people were killed in road accidents in the EU. **In 2008, the deaths have been reduced to about 38,900.** Moreover, according to the latest CARE estimates, still to be confirmed and further analysed, in 2009 the deaths have been reduced to about 35,500, meaning a decrease by 35%.

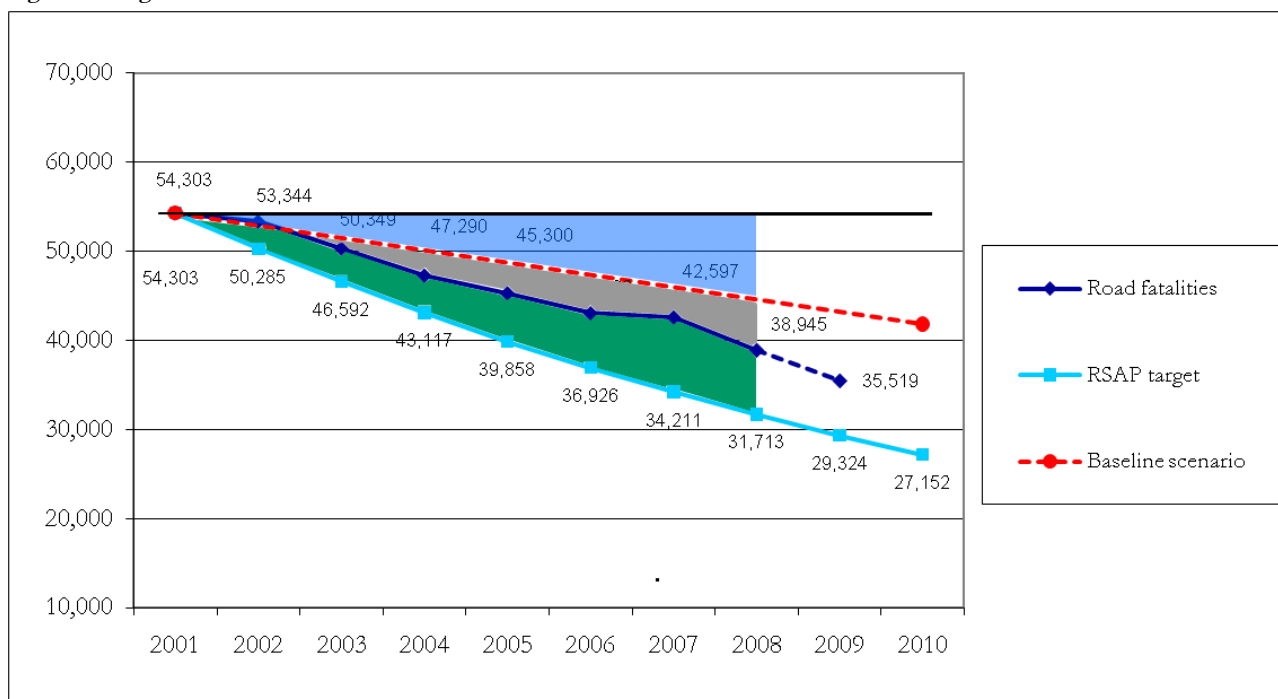
The estimated social cost for road fatalities in 2008 is calculated to be around 59.4 billions Euro. Additionally, **2008 has reported 1,636,900 injuries in 1,250,000 road accidents**, which leads to a further social cost of 81.4 billions Euro. Therefore, if added to the fatalities-related social cost, the total social cost due to road crashes on the European roads has amounted at **140.8 billions Euro.**

This computation of social cost is based on the value of a statistical life calculated by the HEATCO study (2006)<sup>10</sup> and updated in the ERSAP Impact Assessment (see Volume 2). Weighting at the population share the HEATCO values of casualties for the different EU27 countries, the obtained value for a statistical life equals to 1,525,112 Euro in 2008 value. With regard, conversely, to a serious or a slight injury, the values are 204,465 Euro and 15,850 Euro, respectively.

Figure 6 illustrates the evolution of the European road deaths, by comparing the actual achievements (including 2009 estimates) to, on the one side, the target set in the RSAP, and, on the other side, the baseline scenario proposed by SWOV (SWOV, 2007). The latter (baseline scenario) estimates the number of road fatalities in 2010 under the assumption that no additional effort is made to reduce the number of road deaths (“business as usual”), thus leaving out the effects on road safety of the interventions taken in the framework of the RSAP. The estimation made by SWOV is based on structured time series analysis to assess future risk.

This baseline scenario has been used here to estimate the impact of the RSAP in terms of road fatalities and to monetise the achieved benefits. The costs of not meeting the target for a given year, instead, have been calculated from the difference in the number of fatalities in the actual development and the foreseen RSAP target. In this regard, the second variable needs to be considered only as indicative, as the RSAP target is set for the end of the strategy period (2010) and not for intermediate years.

**Figure 6: Target and actual evolution of road fatalities in the EU27**



Source: CARE

Source of the baseline scenario: SWOV, 2007

<sup>10</sup> The HEATCO study, developed within the 6<sup>th</sup> RTD Framework Programme by the EC, aimed at “Developing Harmonised European Approaches for Transport Costing and Project Assessment”.

If considering the trend described in Figure 6, it may be pointed out how the RSAP is producing a positive impact on road safety, which is graphically represented by the distance between the line of the actual number of fatalities (in blue) and the line of the baseline scenario (in red). By summing the differences between the deaths assumed by the baseline scenario and the actual road deaths for each year (i.e. the grey area), it may be possible to estimate that, **between 2001 and 2008, almost 20,400 lives have been saved**, for a total value of about 31.1 billions Euro. According to 2009 estimates, between 2001 and 2009 about 28,000 lives have been saved, for a total value of about 42.8 billions Euro.

Considering the overall reduction of 59,200 deaths recorded in the period 2001-2008, the contribution of the RSAP is one third (see grey area), while the remaining part (38,800 lives saved, see light blue area) has to be linked to the induced impact, for example, of the technical developments or Member States' commitment that have been occurred throughout the period and illustrated by the "business as usual" scenario. The green area is, finally, the difference between the actual number of fatalities and the original RSAP objective.

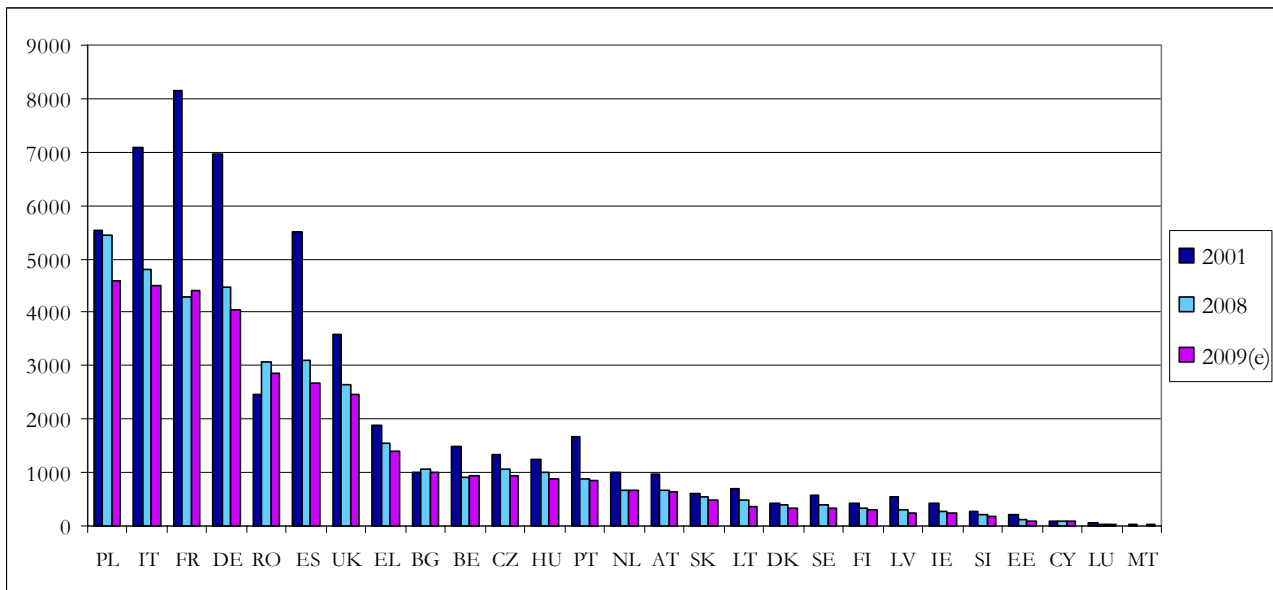
Nevertheless, the impact is not as high as was aimed for in the RSAP. The distance between the line of road fatalities and the target line (in light blue) is still quite remarkable. The year 2008 shows a gap of about 7,200 fatalities between the actual number of fatalities and the original RSAP target, which equals to a social loss of about 11 billions Euro. Considering the CARE latest data, in 2009 this gap will be reduced to about 6,200, with an estimated social loss of almost 9.5 billions Euro.

It should be stressed that the evaluation of the impact of the RSAP as stated above does not explicitly takes into account autonomous national initiatives. Due to the lack of data, it is not possible to separate the changes in road safety attributable to the RSAP or to national measures. However, given the difference between the old and new Member States, it may be reasonably assumed that the RSAP has positively influenced and affected the actions at country level and that the EC has a key role in coordinating and promoting road safety.

Figure 7 and 8 below present the road fatalities by country, both in absolute numbers and in percentage variation. Most of the Member States have experienced a reduction in the total number of road fatalities, but almost none of them is near the objective of halving road deaths. In 2008, only five countries are in line with the target, having achieved a decrease of more than 42% (Luxembourg, France, Portugal, Spain, and Latvia), while the EU27 average reduction remains slightly above 28%. By contrast, only two countries (the most recent Members: Bulgaria and Romania) present an increase in road accidents. In 2009, instead, it is estimated that seven countries are in line with the target, having reduced road deaths by more than 46% (Luxembourg, France, Portugal, Spain, Estonia, Lithuania and Latvia),

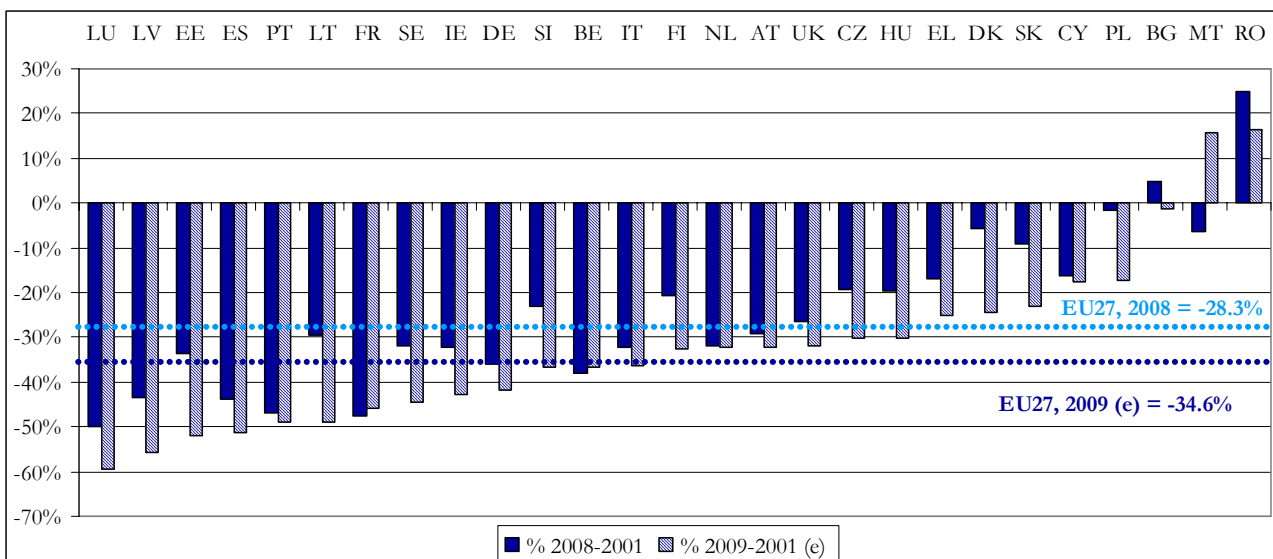
Overall, and with the exception of Denmark (performing worst than average in its group) and Latvia, Lithuania and Estonia (performing better), it is interesting to notice that the best performing countries are all old Member States.

Figure 7: Road fatalities in 2001 and 2008 and 2009 estimates



Source: CARE

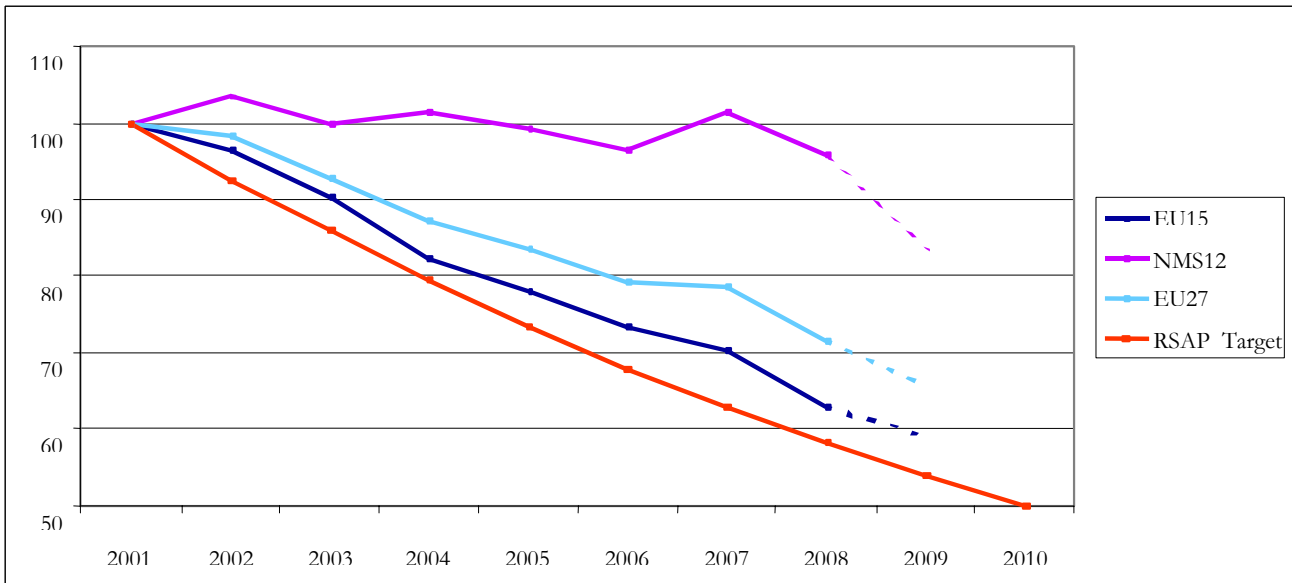
Figure 8: Road fatalities, variation between 2001 and 2008 and 2009 estimates (%)



Source: TRT elaboration on CARE data

The following Chart compares the performance of old (EU15) and new (NMS12) Member States, together with the aggregated performance (EU27) and the RSAP target. Two main considerations may be drawn: on the one side, the old Member States are almost in line with the RSAP target; on the other side, the new Member States present a much more critical situation which would require a special attention in the coming years. However, if the CARE estimates for 2009 are confirmed, a converging process emerges in the performance of the new Members already in this last year. While in 2008 the NMS12 average reduction in road fatalities since 2001 was only 4.2%, compared to the 36.8% in the EU15, in 2008 the NMS12 average reduction was 16.8%, compared to the 40.8% in the EU15.

**Figure 9: Road fatalities, comparison between old and new Member States**

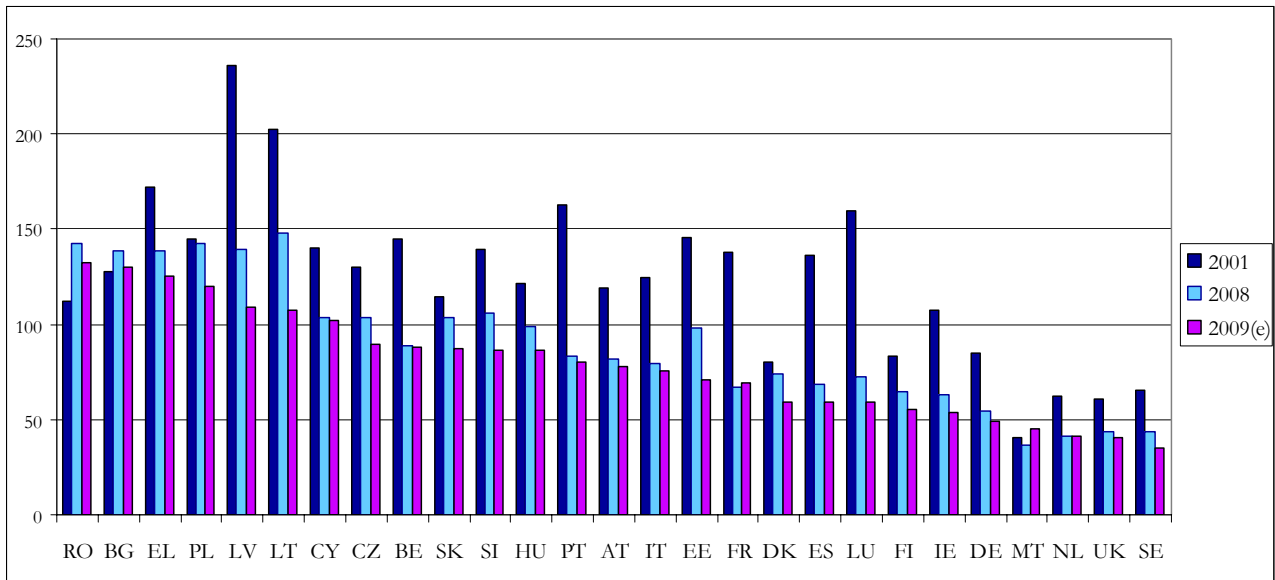


*Source: CARE data*

Interestingly, a common trend may be noticed when looking at the road safety data for the new Member States. Indeed, these countries show an “up and down” trend where the years (2004 and 2007) of their entry to the EU corresponded to an increase in the number of road fatalities, which were then followed by a clear reduction. The reason for this reduction may be motivated by the fact that after the accession road traffic has been increasing at a faster pace, while the implementation of the EU framework, and namely of the RSAP, is progressing more and more in these countries, after some initial lags.

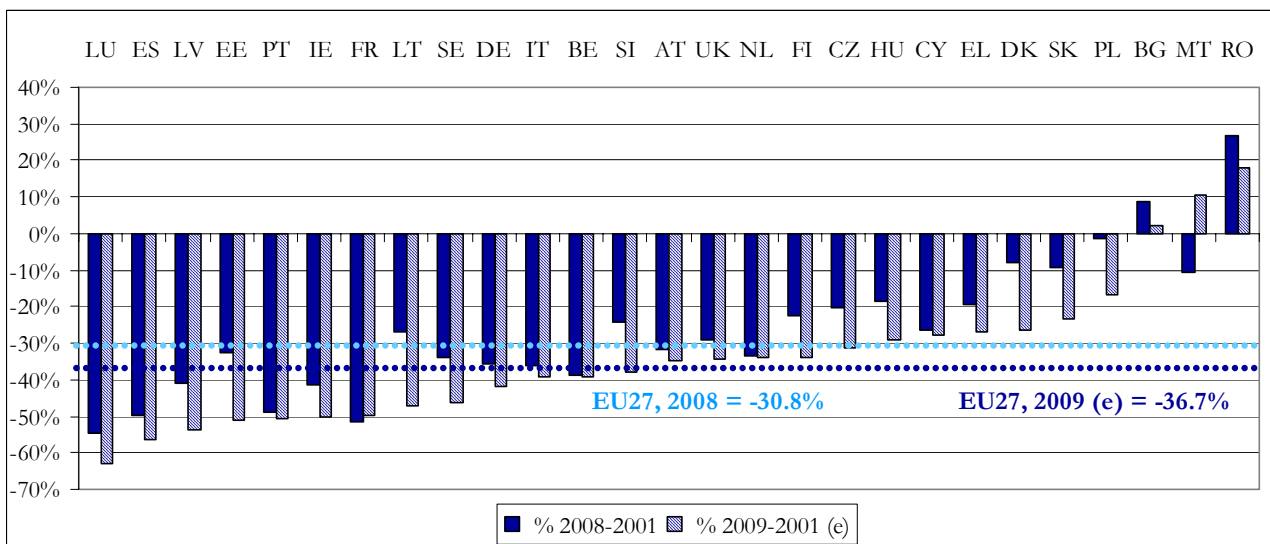
Looking only at the absolute value of fatalities may be misleading. A more appropriate indicator of the actual fatality risk faced by the EU citizens is, in fact, represented by the ratio of road deaths to the total population. The number of road fatalities per million inhabitants is presented in absolute numbers and in percentage variation in the following Figures 10 and 11. Clearly, this indicator is more suitable for comparing the performance of different Member States, since it is weighted according to the dimension of the country.

Figure 10: Road fatalities per million inhabitants in 2001 and 2008 and 2009 estimates



Source: CARE

Figure 11: Road fatalities per million inhabitants, variation between 2001 and 2008 and 2009 estimates (%)



Source: TRT elaboration on CARE data

In this case, the average reduction of road fatalities in 2008 equals to 31%, that is slightly more than the reduction calculated on the data un-weighted by country population. This means that the population has been growing at a faster pace if compared to the rate of road fatalities reduction, leading to a smaller risk of road death per million inhabitants.

Even more remarkable is observing the evolution of road deaths together with the evolution of road traffic, by making use of the indicator of road fatality per 1 billion vehicles-km (vkm), which is calculated as the ratio of traffic deaths to the vehicles travelling on European roads. This indicator is very significant because the amount of traffic directly influences the risk of accident. Unfortunately, and due to the fact that conducting statistical surveys is difficult, not least because of their considerable costs, this last data is available only for few countries and for year 2007 at the latest. The available data are presented in the Table below.



**Table 5: Road fatality per 1 billion vehicles-km**

Country	Year	All roads	Motorways
CZ	2006	20.06	5.05
SI	2006	16.05	8.01
BE	2007	10.08	4.02
AU	2006	8.09	4.02
DK	2007	8.02	1.09
FR	2007	8.02	2.03
NL	2003	7.07	2.01
DE	2007	7.02	2.07
FI	2007	7.00	2.04
SE	2007	6.01	-
UK	2007	5.07	1.08

*Source: IRTAD*

At present, the RSAP focuses on one indicator only, i.e. road fatalities, though attention should be paid to the number of **road accidents** and the **number of injuries** as well, and by keeping in mind that the data on accidents and injuries are less reliable and consistent than those on fatalities.

Figure 12 summarises the evolution in road fatalities, injuries and accidents in the EU between 2001 and 2008, adding the indicative trend calculated for the total number of registered vehicles<sup>11</sup> and the number of vkm<sup>12</sup>, which are the most significant variables for risk exposure.

It is noticeably visible that the reduction in road accidents, injuries and fatalities has been achieved in an environment where the risk of accident due to the growth of vehicles use is constantly increasing. Moreover, it shows that the number of road deaths has been decreasing at a much faster pace than the number of accidents and injuries: the first saw a reduction of 28.3%, while accidents and injuries decreased only by 14.6% and 17.6% respectively.

It also emerges that the impact of road accidents on human lives, represented by the growing distance between the line of road fatalities (light blue) and the line of road accidents (purple), has been decreasing. Instead, accidents and injuries show a strong and steady correlation.

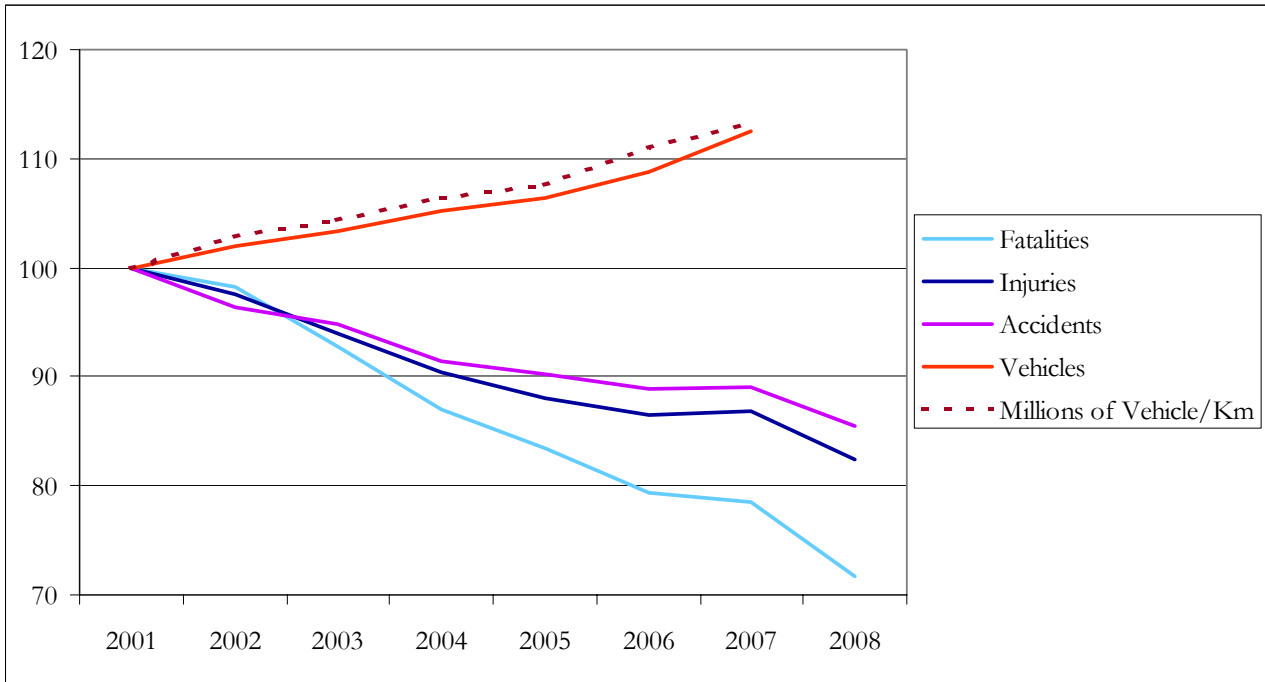
It may be concluded that road safety has improved significantly over time in the EU, also given the high growth occurred in mobility. At the same time, it appears that the level of road fatalities are still

<sup>11</sup> Due to the lack of data, the trend of the total vehicles has been calculated only on the data of AT, BE, CY, CZ, DE, HU, LT, LU, LV, NL, PL, RO, SE, SI, SK.

<sup>12</sup> Due to the lack of data, the trend of vehicle-km has been calculated only on the data of six countries: AT, CZ, EE, FI, SI, UK. This number should be considered with caution as an indicative trend of the traffic growth.

too high as compared to the RSAP target. This suggests that the impact of the initiatives taken in the field of road safety still needs to be further enhanced.

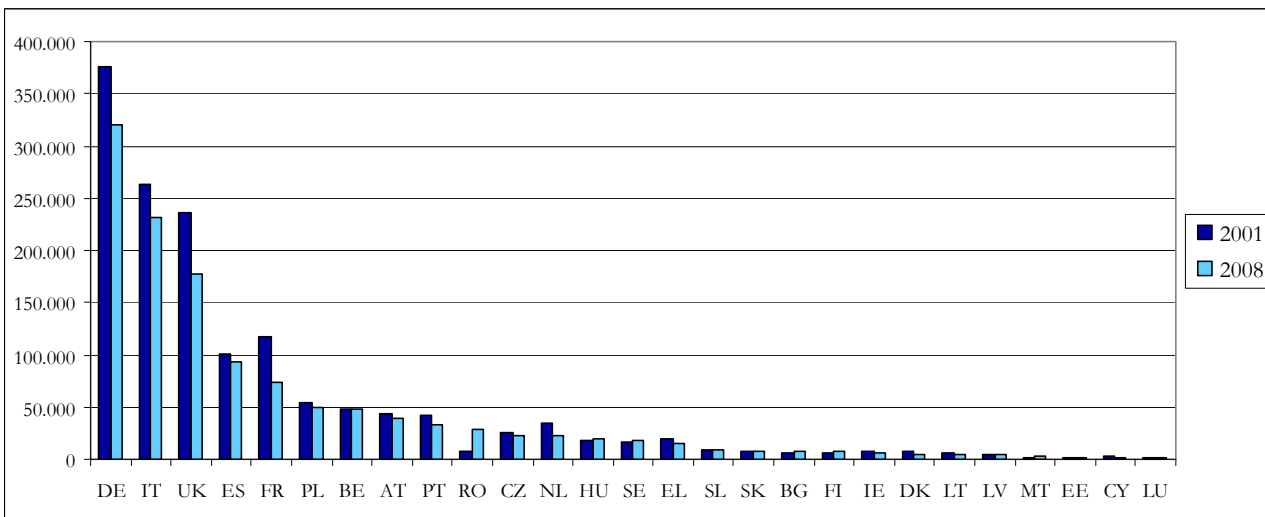
**Figure 12: Evolution of road fatalities, injuries and accidents in the EU27 (year 2001 = 100)**



Source: TRT elaboration on CARE and EUROSTAT data

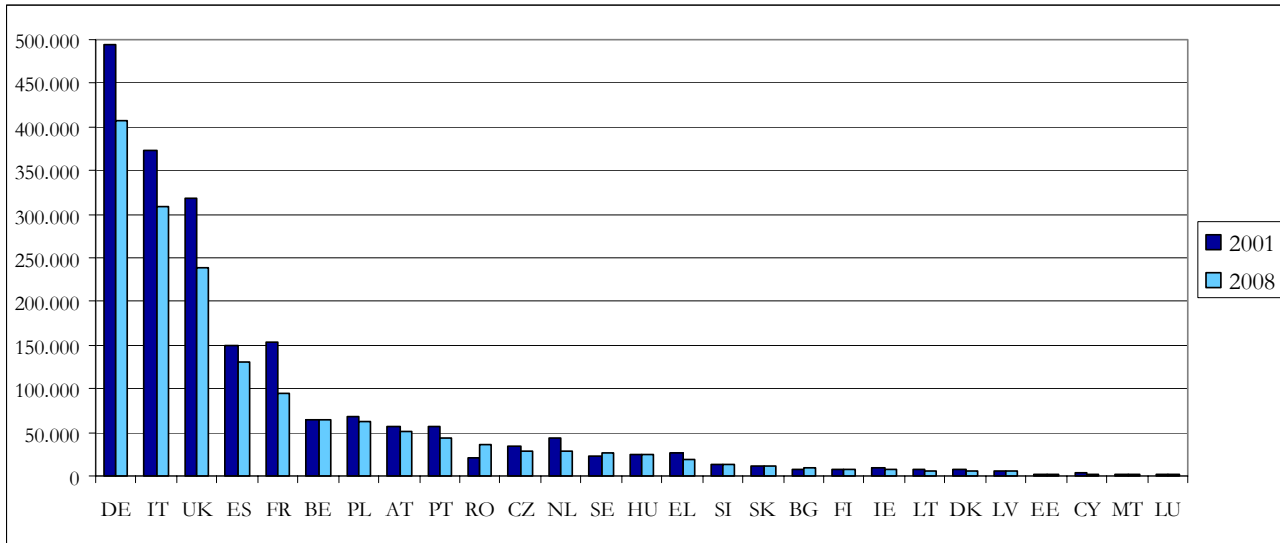
Figures 13 and 14 highlight the number of accidents and injuries between 2001 and 2008 in each of the 27 Member States.

**Figure 13: Road accidents, 2001 and 2008**



Source: CARE

**Figure 14: Road injuries, 2001 and 2008**

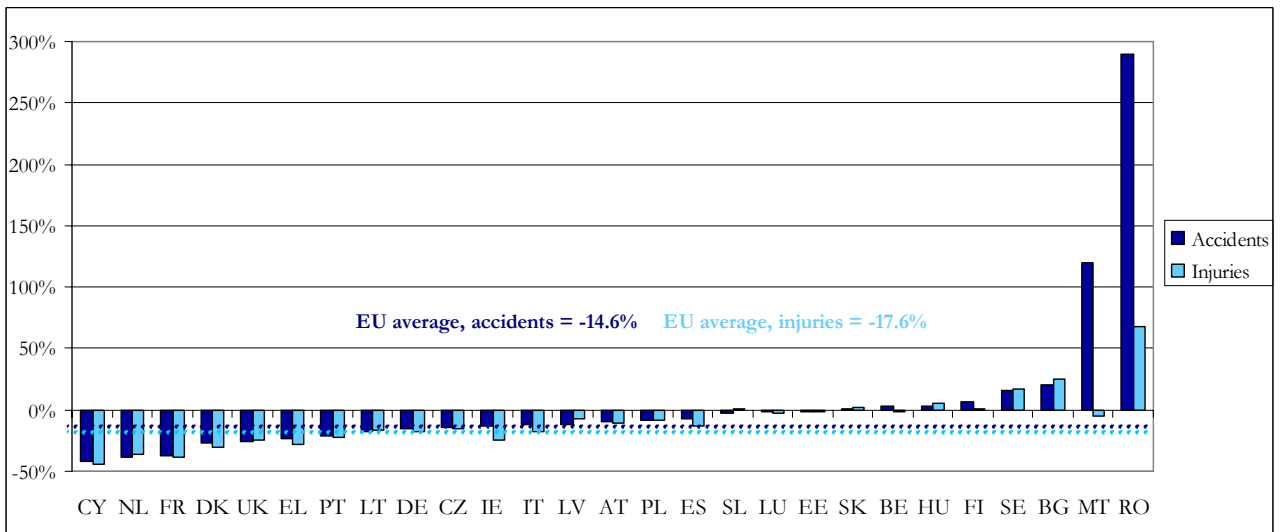


Source: CARE

In most countries the numbers of accidents and injuries show the same trend: if accidents have been increasing, also injuries have, and vice-versa<sup>13</sup>. The sole exceptions are represented by Slovenia (where the number of injuries have been increasing despite a reduction in the number of accidents) and Belgium and Malta (where injuries have been decreasing even if road accidents have not).

Again, the best performing countries may be found amongst the old Member States, while the largest growth in road accidents and injuries may be pointed out in the new Member States. In this case, Sweden and the Czech Republic make the exception. In this respect, Figure 15 compares the national percentage variation between 2001 and 2008 for each country.

**Figure 15: Road accidents and injuries, variation between 2001 and 2008 (%)**



Source: TRT elaboration on CARE data

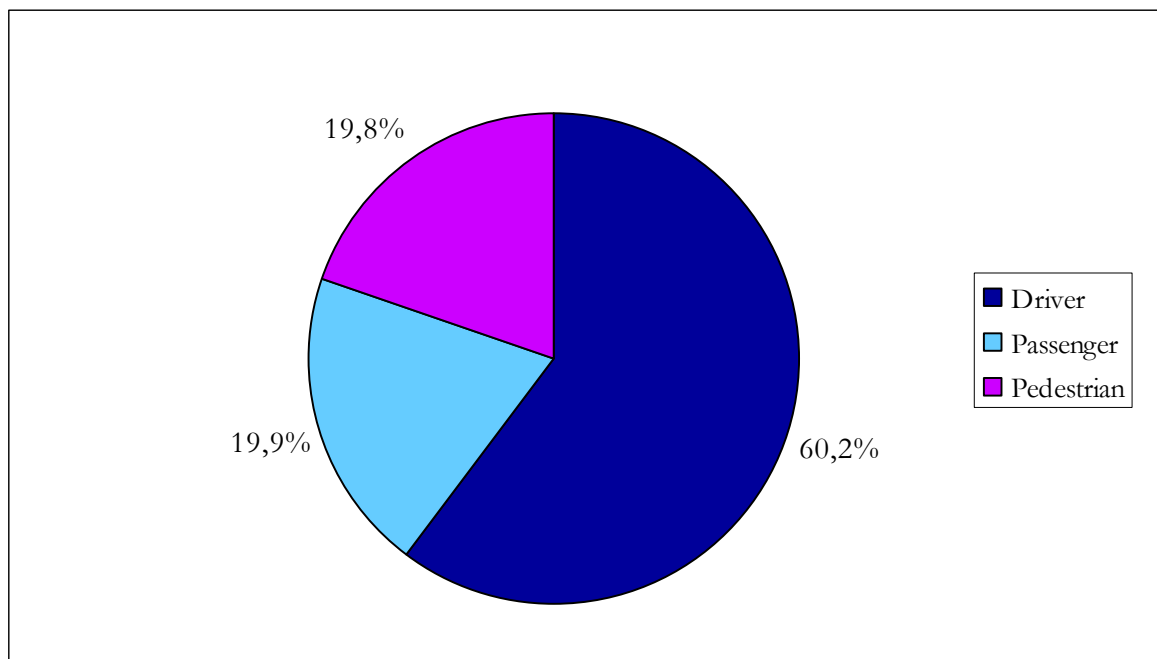
#### 4.1.2 Characteristics of road fatalities

This Paragraph aims at elaborating on some of the characteristics of the road fatalities occurring in the EU. The objective is trying to identify some of the key risk areas concerning road safety, concisely introducing the main issues that need to be addressed.

Nonetheless, a more extensive evaluation of the most problematic areas is provided in the ex-post analysis addressing the single measures of the RSAP aggregated by targets and domain of action. In fact, the key risk areas are all addressed in the RSAP, which includes actions on the most important causes of accidents (such as, for example, speed, alcohol and drugs, not wearing seat belts) and targets specific groups of road users of particular concern (such as young and novice drivers, pedestrian, cyclists and professional drivers).

The first exercise is observing the distribution of road fatalities by the type of road user, distinguishing between driver, passenger and pedestrian (see Figure 16 below).

*Figure 16: Fatalities by type of road users, 2007<sup>14</sup>*



*Source: CARE*

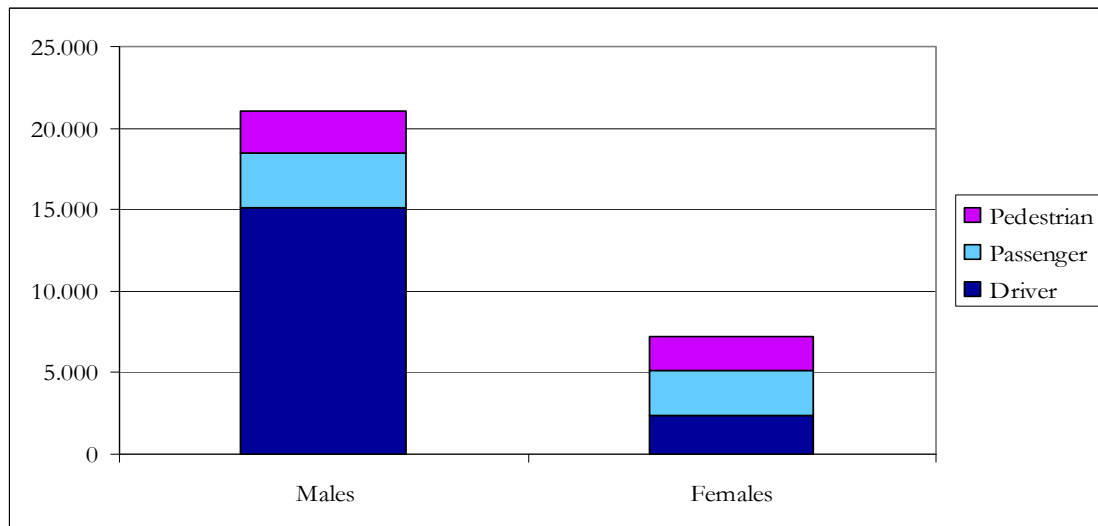
It may be observed that the large majority of the road deaths (about 80%) concerns vehicle occupants, amongst which 60% concerns the driver and 20% the other passengers of the vehicle. This suggests the importance of implementing passive safety measures, which are developed to protect vehicles occupants and may contribute to reduce their mortality risk.

<sup>13</sup> It needs to be considered that the high correlation between the number of accidents and the number of injuries is also due to the under-reporting of accidents without injuries.

<sup>14</sup> Some of the national data included in the average refer to CARE estimates: IE, PL, BG, DE, CY.

Looking at the fatalities distribution by gender, illustrated in Figure 17, it is evident how men are victim of road traffic more often than women: males represent 76.4% of the total road fatalities, while female only 23.6%.

**Figure 17: Fatalities by gender, 2007<sup>15</sup>**



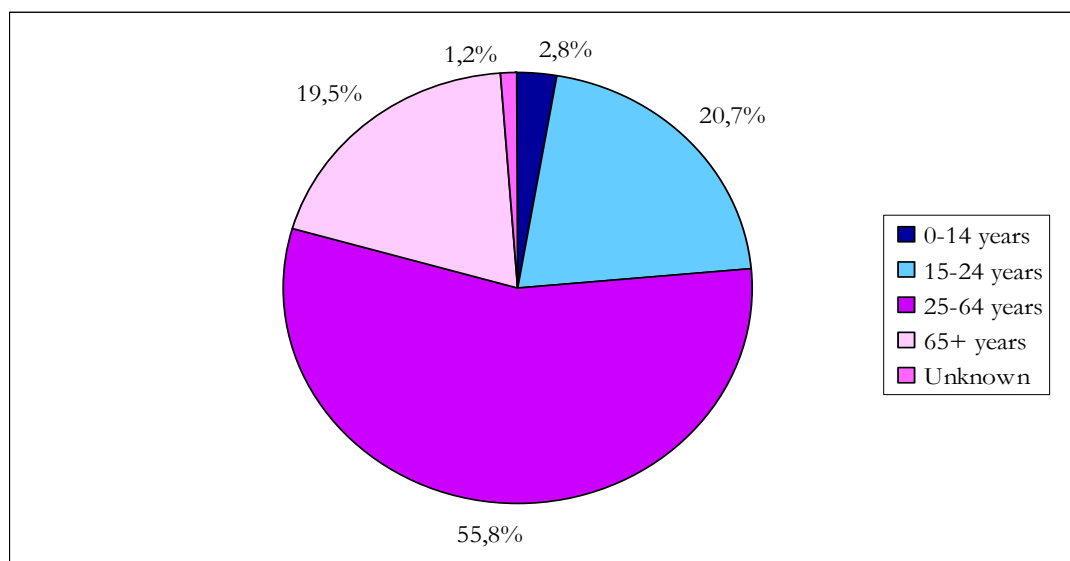
**Source: CARE**

This may be explained by the larger participation of men in road transport, whereas the share of male drivers as opposed to the shares of other male road user is much larger, if compared to the female distribution. It is also likely that the females’ risk propensity is smaller than the males’ one, meaning that females generally behave more carefully and prudently.

Concerning age categories, Figure 18 below illustrates the distribution of road fatalities in 2007 by different class of population.

<sup>15</sup> Some of the national data included in the average refer to previous years: BE data date at 2006, IE at 2003, LU at 2004, PL at 2005. Data from BG, DE, CY, LY, RO, SI and SK are not included.

Figure 18: Fatalities by age group, 2007



Source: CARE

Not surprisingly, the most affected category is the group aged between 25 and 64 years old, although the data should be read taking into consideration the weight of the different group in the total population, in order to properly understand the real risk faced by the various categories.

When referring to Table 6, the over-representation in road deaths of the young people aged between 15 and 24 years old may be stressed, if compared to the proportion in the total population: they only represent the 12.6% of the European population, but so much as the 20.7% of the deaths on the European roads. Importantly, also aged people appear to be slightly overrepresented in road fatalities; this may become a major concern in the future in view of the ageing trend.

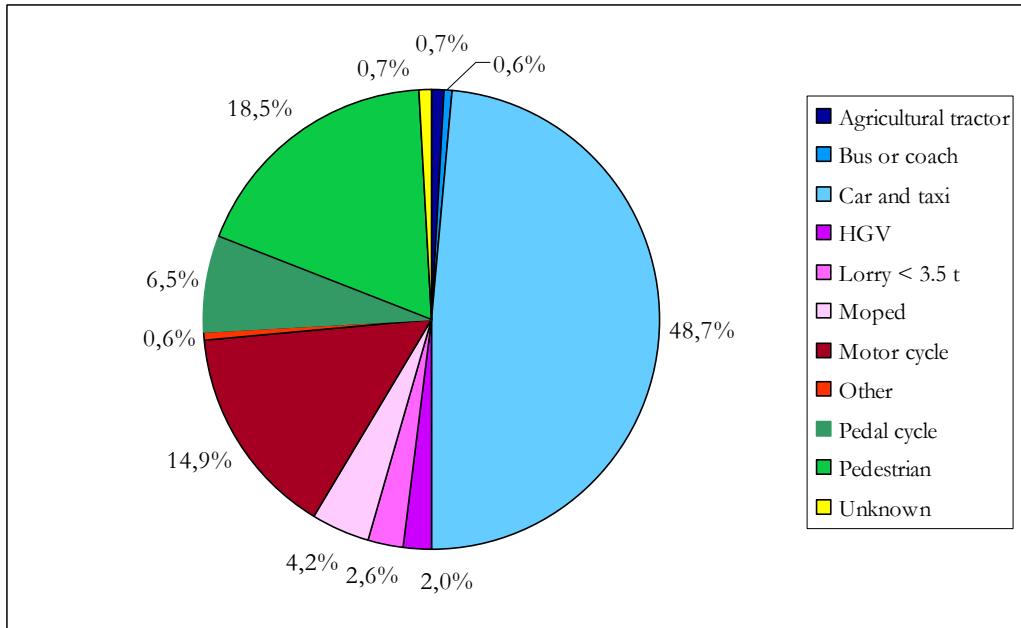
Table 6: Population and fatalities by age group, 2007

	0-14 years	15-24 years	25-64 years	65+ years
% Total population	15.8%	12.6%	54.5%	16.9%
% Road fatalities	2.8%	20.7%	55.8%	19.5%

Source: CARE, EUROSTAT

Figure 19 looks at the proportion of the different transport modes involved in deadly road accidents. Firstly, it indicates the great share of passengers cars and taxis, representing almost the half of the transport modes concerned by deadly accidents. But it can also be noticed the relative importance of the percentages regarding the vulnerable road users (cyclists and pedestrians) and motorcycles and mopeds.

Figure 19: Fatalities by transport mode, 2007<sup>16</sup>



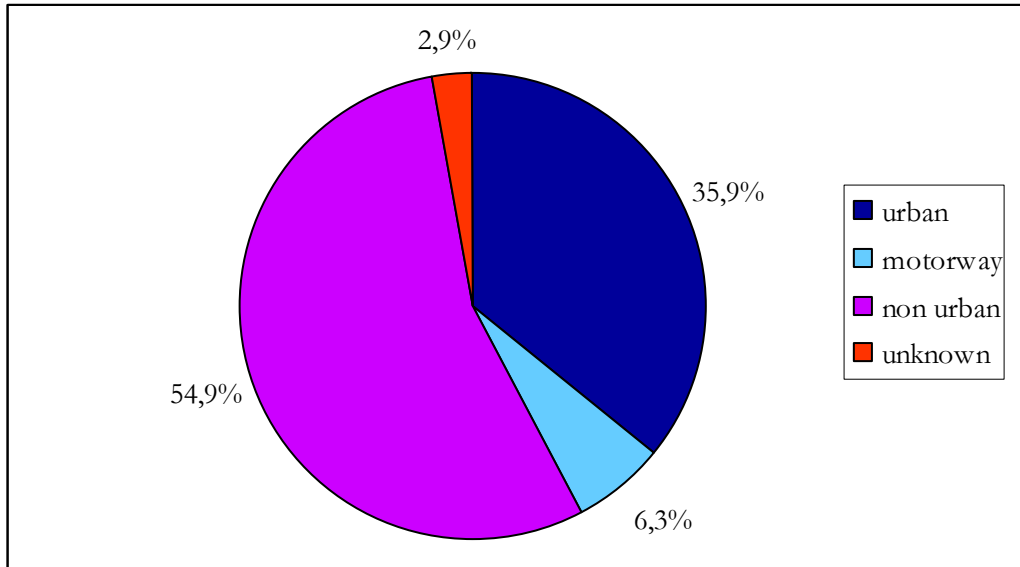
Source: CARE

Finally, it is interesting to look at the mortality rate by type of road, distinguishing between urban areas, motorways and rural roads (all the extra-urban roads but motorways). Figure 20 shows that more than the half of the fatal accidents occurs in the extra-urban areas, indicating that the risk of being killed on rural roads is generally higher than in urban areas or motorways.

The higher fatality rate in rural roads applies to all the countries taken in consideration, as illustrated in Figure 21. Only Greece and Latvia make an exception, but due to the large percentage of the label “unknown” the data is not significant.

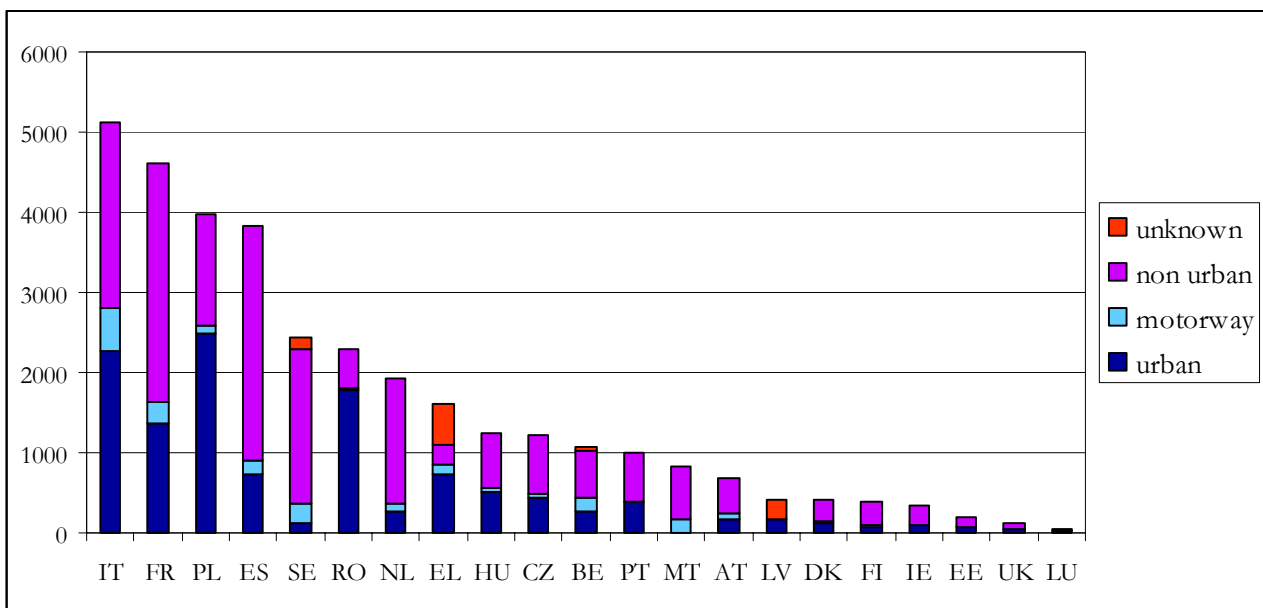
<sup>16</sup> Some of the national data included in the average refer to previous years: BE data date at 2006, IE at 2003, LU at 2004, PL at 2005. Data from BG, DE, CY, LT, RO, SI and SK are not included.

Figure 20: Fatalities by type of road, 2007<sup>17</sup>



Source: CARE

Figure 21: Fatalities by type of road, 2007<sup>18</sup>



Source: CARE

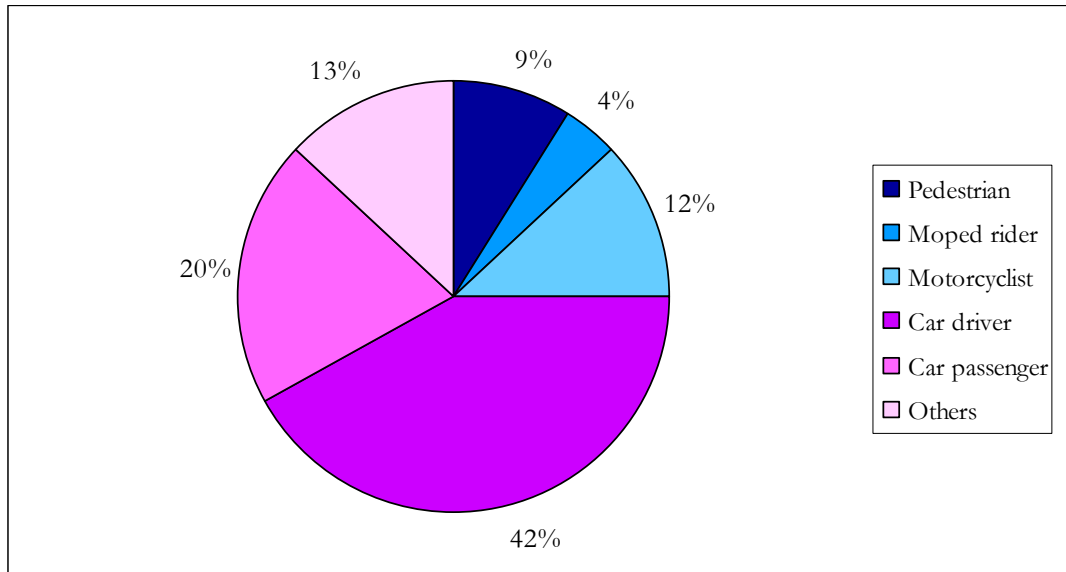
Since rural roads have such a large weight on the places where accidents occur, it is worth analysing with more details the fatalities on this kind of roads, distinguishing between the different types of road users (see Figure 22 in this respect). Unfortunately, the last available CARE data in this respect refer to year 2005, but it is still worth mentioning them.

<sup>17</sup> European average calculated on 20 countries: AT, BE, CZ, DK, EE, EL, ES, FI, FR, HU, IE, IT, LU, LV, MT, NL, PL, PT, SE, UK. Some of the national data included in the average refer to previous years: IE data dates at 2003; UK, PL and LU at 2005 and BE at 2006.

<sup>18</sup> Some of the data refer to previous years: IE data dates at 2003; UK, PL and LU at 2005 and BE at 2006.



Figure 22: Rural roads: fatalities by type of road users, 2005



Source: CARE

Confronting the figure above with the Figure 21 of the fatalities by transport mode on all kind of roads, it comes into view that the higher risk on rural roads concerns in particular car occupants. In fact, they represent 62% of the deaths outside urban areas, while they represent only 48.7% of the deaths on all roads. The fatalities concerning accident involving motorcycles and mopeds present more or less the same share on rural roads (12% and 4%, respectively) and on the whole road infrastructure (14.9% and 4.2%, respectively). Pedestrians, instead, face a much larger risk inside urban areas, accounting for 18.5% of the fatalities on all roads, but only for 9% of the fatalities on rural roads.

## 4.2 Complying with basic road safety rules

The following Sections analyse how drivers' behaviour have been affected by the policies of enforcement and by the initiative of awareness raising.

### 4.2.1 Enforcement of road safety rules

The issue of enforcement is covered in the RSAP by the following three measures:

- **Measure 8:** Propose measures to strengthen checks and ensure the proper enforcement of the most important safety rules.
- **Measure 9:** Develop best practice guidelines as regards police checks.
- **Measure 13:** Harmonise, over time, the penalties for the main infringements of the rules of the road for international hauliers.

The main purpose of these measures is to bring forward an integrated approach to road safety, where enforcement plays a serious role besides driver education and continuous awareness information

campaigns. Thus, effective enforcement complements and further strengthens the positive results the above mentioned initiative may generate.

Indeed, enforcement affects the third component of the road system, i.e. the “human being” (or driver) and his/her driving behaviour, where a major attention has been paid to the following aspects:

- increasing cooperation among Member States in the view of improving cross-border infringement enforcement;
- improving the enforcement of speed and alcohol limits, and wearing seat-belts;
- increasing the number of police checks;
- improving cross-border enforcement.

In particular, on the one side, continuous and systematic police checks and, on the other side, effective sanctions represent the most promising tool for tackling the infringements of the main road safety rules, thus leading to a reduction in deaths and injuries in a very cost-effective way.

***Box 1: Enforcement of road safety rules: Stakeholders’ main comments***

In the stakeholders’ comments concerning strengthening checks and ensuring the proper enforcement of the most important safety rules, progress has been evaluated between “low” and “medium”, and judgements differ quite considerably when looking at the impacts in terms of effectiveness.

Stakeholders acknowledge that enforcement is a key factor in creating the conditions for a considerable reduction in deaths and injuries, especially when it is intensively applied and widely publicised. Therefore, measures on enforcement should be strongly present in the new RSAP. Among the main priorities, there is the setting up of a system for managing cross-border enforcement of traffic offences, as well as the implementation of a Directive ensuring the minimum requirements of enforcement along the lines of those included in the EC Recommendation.

For the specific comments on the single measures please refer to the measure factsheets provided in Annex 1.2.

#### **4.2.2 Road safety awareness**

The RSAP includes two measures specifically designed for increasing awareness and understanding of road users concerning road safety issues.

- **Measure 10:** Collect, compare and publish information on national highway codes, and on infringements established and penalties imposed in the various countries.
- **Measure 11:** Participate in awareness campaigns about drinking and driving, seat belts, speed and fatigue, if possible combined with national police activities.

The objective of the first measure (Measure 10) is to spread information on the rules on road safety across the EU, while the objective of the second measure (Measure 11) is to inform the public about the driving behaviour increasing the risk of accident and exacerbating its consequences.

From a broad perspective, awareness campaigns are usually regarded as the most valuable and effective actions to promote road safety, namely if they are organised as a large national campaigns combined with enforcement and other measures. Such measure has been implemented in all EU countries over the last decade, and more importantly it has been regularly reiterated in order to widen as much as possible not only the target groups (youngsters, elderly people, drivers, etc.), but also the scope of the campaigns themselves (speed, fatigue, alcohol limits, wearing seat-belts, etc.).

Communication plays a key role and has levered on three main goals:

- making people aware of road dangerousness in order to encourage a social demand for road safety;
- improving people's knowledge and consequently compliance to the road safety rules, which also implies making repression more acceptable;
- encouraging people to change in a sustainable way towards a safe driving behaviours;
- consolidating safe behaviour (habit formation);
- informing and advising on new regulation and measures.

For the specific comments on the single measures please refer to the measure factsheets provided in Annex 1.2.

### **4.3 Driving licensing and training**

The following measures look at the safety of novice drivers, and include actions to improve driving education and training:

- **Measure 14:** Amend Directive 91/439/EEC on driving licences in order to introduce in particular minimum standards for car driving examiners and a staged driving licensing system for motorcyclists, trucks and bus drivers to reduce accident risks among inexperienced drivers.
- **Measure 15:** Continue work on reviewing, in the light of scientific progress, minimum standards for physical and mental fitness to drive and study the impact of medical examinations on road safety.
- **Measure 16:** Work towards establishing a scientific approach to learning how to drive and to road safety training, from school age.
- **Measure 17:** Continue specific work on young drivers and rehabilitation methods to reduce re-offending.

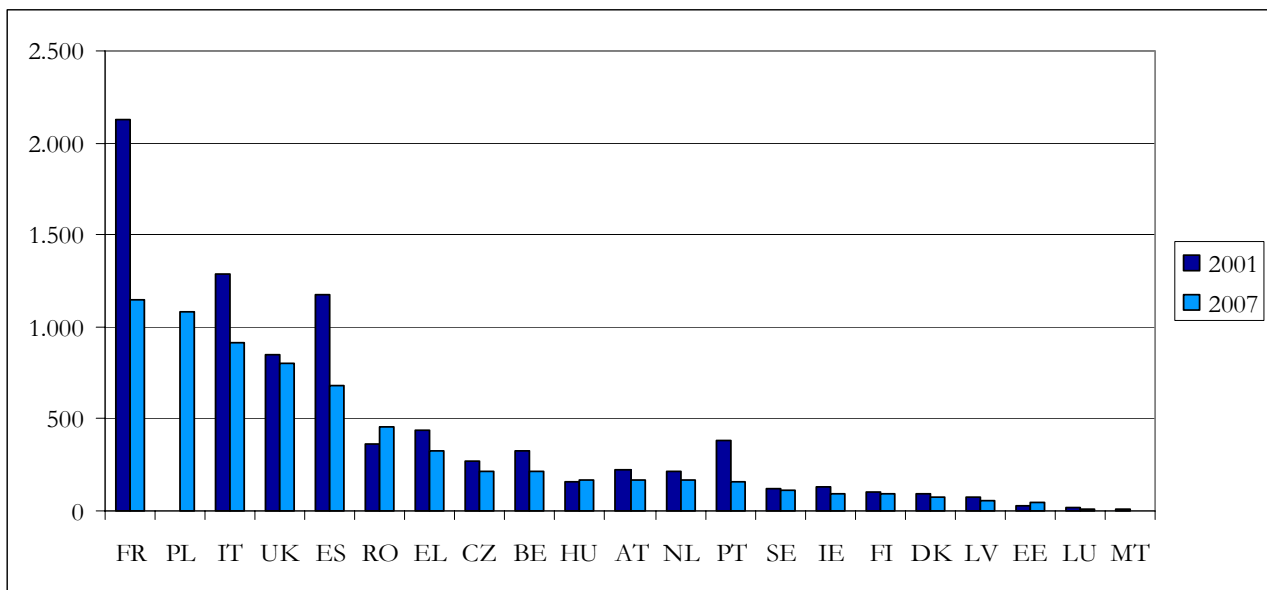
Measure 48, which addresses the training of professional drivers, is analysed within the measures specifically targeting road hauliers (see Chapter 4.8).

Even if the measures concerning training and driving licences address the whole population, most of their impact on road safety is to be found in the group of young driver aged between 15 and 24 years old. They represent, in fact, the large majority of the novice drivers.

It has already been shown that young people aged between 15 and 24 years old are overrepresented in road fatalities in comparison to the total population. They also face highest risk for what concerns speeding, drink and drug-driving.

Figure 23 and Table 7 provide an overview of the total road fatalities among young drivers in the different countries and the relative percentage variations. It appears that an important reduction in the roads deaths of the age group. Only Romania, Hungary and Estonia present a growing fatality rate, but the variation in numbers is rather small.

**Figure 23: Young people road fatalities, 2007 and 2001**<sup>19</sup>



Source: CARE

<sup>19</sup> Data for BG, DE, CY, LT, SI, SK are not available.

**Table 7: Young people road fatalities, 2007 and 2001 percentage variation<sup>20</sup>**

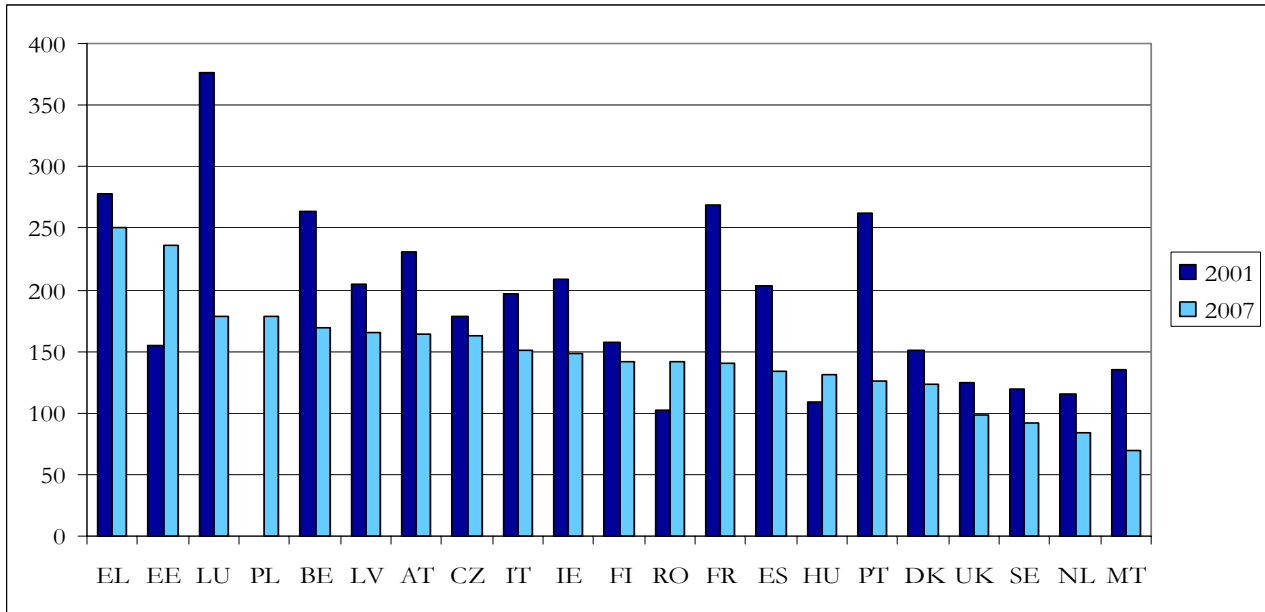
	2007	2001	Years, if different	% variation
FR	1150	2131		-85,3%
PL	1081	n.a.	2005	n.a.
IT	913	1287		-41,0%
UK	800	846		-5,8%
ES	685	1172		-71,1%
RO	454	367		19,2%
EL	323	436		-35,0%
CZ	219	273		-24,7%
BE	216	327	2006-2001	-51,4%
HU	169	161	2007-2003	4,7%
AT	167	220		-31,7%
NL	166	218		-31,3%
PT	159	384		-141,5%
SE	108	122		-13,0%
IE	94	133	2003-2001	-41,5%
FI	93	104		-11,8%
DK	76	91		-19,7%
LV	59	70	2007-2006	-18,6%
EE	49	31	2007-2005	36,7%
LU	10	19	2005-2001	-90,0%
MT	4	8	2007-2005	-100,0%

Source: TRT elaboration on CARE data

Some more significant information may be obtained by looking at the fatalities values weighted by the population of the same age group (see Figures 24 and 25 in this respect). In fact, the ratio of the fatalities per million inhabitants, which indicates the risk of being killed per million inhabitants, may be used for countries comparison.

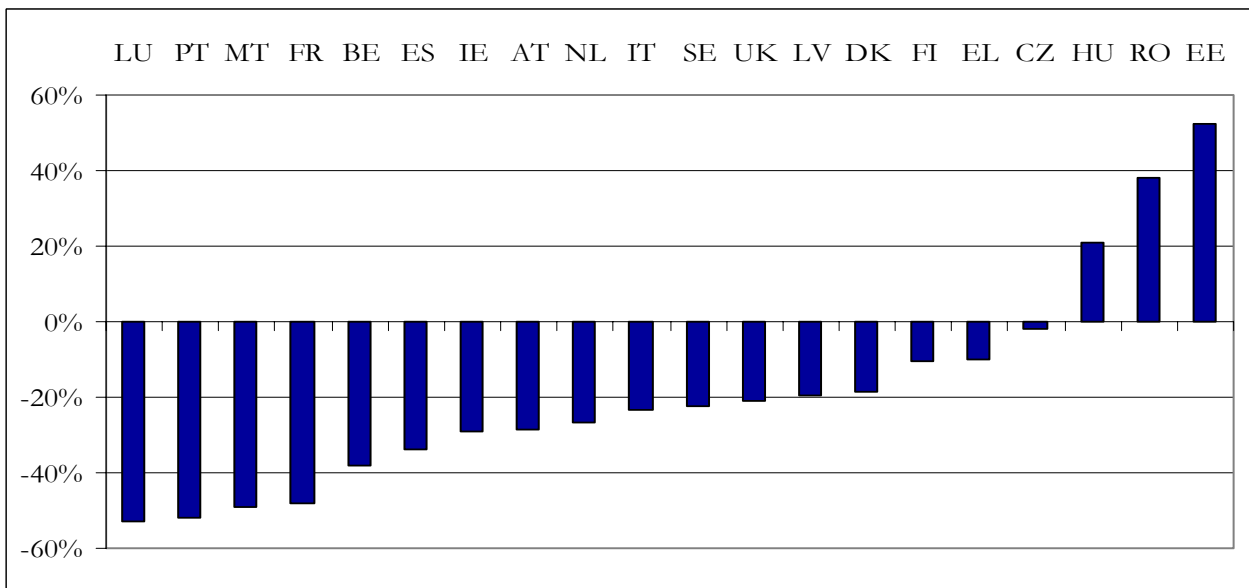
<sup>20</sup> Data for BG, DE, CY, LT, SI, SK are not available.

Figure 24: Young people road fatalities per million inhabitants, 2001 and 2007<sup>21</sup>



Source: TRT elaboration on CARE data

Figure 25: Young people road fatalities per million inhabitants, 2007 and 2001( %) <sup>22</sup>



Source: TRT elaboration on CARE data

The aforementioned Figures confirm the important reduction in the risk of young people of being killed on European roads: on average, the fatality risk decreased from 199 fatalities per million inhabitants in 2001 to 163 fatalities per million inhabitants in 2007.

Nevertheless, the risk per million inhabitants for this age category remains much higher than the risk for the total European population (86 fatalities per million inhabitants in 2007 and 78 in 2008). Therefore special attention remains to be given to this issue.

<sup>21</sup> Data for BG, DE, CY, LT, RO, SI, SK are not available.

<sup>22</sup> Data for BG, DE, CY, LT, PL, SI, SK are not available.

For the specific comments on the single measures please refer to the measure factsheets provided in Annex 1.2.

#### **4.4 Impaired driving**

Three measures specifically target the issue of impaired driving, related to alcohol, drugs use and fatigue.

- **Measure 12:** Encourage the application of the recommendation on the blood alcohol limit; continue work on the effects of drugs and medicines; establish appropriate classification and labelling of medicines which affect driving ability.
- **Measure 33:** Examine driver impairment detection devices, e.g. alcohol ignition interlocks (“alcolocks”) and driver fatigue detectors.
- **Measure 49:** Tighter legislation (and enforcement) of driving and rest periods for commercial road haulage.

The target of the first measure (Measure 12) is twofold: encouraging the application of the recommendation on the blood alcohol limit, which produces a direct impact by addressing the adverse effect of alcohol consumption; researching the effects of drugs and medicines, instead, can have an indirect effects in the medium-long term.

The second measure (Measure 33) is a thematic study in the domain of vehicle active safety aimed at developing impairment detection devices. The study itself impacts only indirectly on road safety, though the future application will provide a direct contribution.

Finally, the third measure (Measure 49) only concerns a specific target group (professional drivers) and has a direct impact on the performance of the drivers of the commercial vehicles.

*Box 2: Impaired driving: Stakeholders' main comments*

The judgement on the driver impairment detection devices has been quite severe from the side of the stakeholders. Low progress has been achieved in their views, firstly because technology is still not sufficiently mature. In the case of the alcolocks, they are not yet market ripe and would need further development in view of a potential deployment.

Moreover, the installation of an alcohol interlock system should not be mandatory for all drivers, otherwise it would negatively affect the majority of drivers who behave correctly and that will have to bear the cost and discomfort of a system that only a minority needs.

#### **4.4.1 Alcohol**

In the EU, driving under the influence of alcohol contributes, on average, to 18% of the road fatalities. It means, in absolute numbers, that fatalities on European roads involving alcohol are about 7,600 in 2007, costing to society about 11.7 billions Euro.

Table 8 shows the percentages of road traffic deaths due to alcohol in the different EU countries, together with the indication of the national blood alcohol limits (BAC). It may be noted that the countries presenting a lower percentage of road fatalities involving alcohol tend to have lower BAC limits or BAC limits differentiated by category of drivers, even if the relation may not be considered straightforward, also depending on specific local factors.



**Table 8: Road traffic deaths (2007) involving alcohol and national BAC limits**

	<b>BAC limit: general population</b>	<b>BAC limit: young or novice drivers</b>	<b>BAC limit: professional drivers</b>	<b>Road traffic deaths involving alcohol (2007)</b>
BE	0.05 g/dl	0.05 g/dl	0.05 g/dl	n.a.
DK	n.a.	n.a.	n.a.	n.a.
ES	0.05 g/dl	0.03 g/dl	0.03 g/dl	n.a.
IT	0.05 g/dl	0.05 g/dl	0.05 g/dl	n.a.
LU	n.a.	n.a.	n.a.	n.a.
MT	0.08 g/dl	0.08 g/dl	0.08 g/dl	n.a.
RO	0.00 g/dl	0.00 g/dl	0.00 g/dl	2%
CZ	0.0 g/dl	0.0 g/dl	0.0 g/dl	3%
SK	0.00 g/dl	0.00 g/dl	0.00 g/dl	4%
BG	0.05 g/dl	0.05 g/dl	0.05 g/dl	5%
EL *	0.05 g/dl	0.02 g/dl	0.02 g/dl	7,2%
AT	0.05 g/dl	0.01 g/dl	0.01 g/dl	8%
DE *	0.05 g/dl	0.0 g/dl	0.05 g/dl	12%
LT *	0.04 g/dl	0.02 g/dl	0.02 g/dl	12%
HU *	0.0 g/dl	0.0 g/dl	0.0 g/dl	12%
PL	0.02 g/dl	0.02 g/dl	0.02 g/dl	14%
UK *	0.08 g/dl	0.08 g/dl	0.08 g/dl	17%
CY	0.05 g/dl	0.05 g/dl	0.05 g/dl	18%
SE *	0.02 g/dl	0.02 g/dl	0.02 g/dl	20%
LV *	0.05 g/dl	0.02 g/dl	0.05 g/dl	21%
FI	0.05 g/dl	0.05 g/dl	0.05 g/dl	24%
NL	0.05 g/dl	0.02 g/dl	0.05 g/dl	25%
FR *	0.05 g/dl	0.05 g/dl	0.05 g/dl	27%
PT *	0.05 g/dl	0.05 g/dl	0.05 g/dl	31%
IE **	0.08 g/dl	0.08 g/dl	0.08 g/dl	37%
SI	0.05 g/dl	0.00 g/dl	0.00 g/dl	38%
EE	0.02 g/dl	0.02 g/dl	0.02 g/dl	48%
AVERAGE				18%

\* Data refer to year 2006.

\*\* Data refer to year 2003.

Source: WHO, 2009

SafetyNet has developed a specific safety performance indicator for alcohol called “the percentage of fatalities resulting from accidents involving at least one driver impaired by alcohol”. But the comparison of Safety Performance Indicators (SPI) values for alcohol between countries remains

difficult due to the differences in calculation methods and underlying reporting practices, leading to various levels of underreporting. Some countries include all fatalities from accidents where drivers under the influence have been involved, whereas others include only fatalities from accidents caused by drivers under the influence, the concept of cause being problematic in road accidents research.

In any case, the report on road safety performance indicators (SafetyNet, 2008) affirms that no major difference was found in the values of SPIs produced over the years. Therefore this confirms how tackling drink driving remains of primary concern. .

#### 4.4.2 Drugs

The impact of psychoactive substances on driving is complex to assess, because impairment may be caused by a wide range of legal or illegal drugs, with different effects, and the presence in the body of such substances does not always imply impairment (unlike alcohol). Therefore, it is difficult to develop an effective benchmark for the enforcement. Moreover, there is a lack of data on the contribution of drug use to road fatalities for carrying out a proper quantitative evaluation on the impact on road safety of psychoactive substances.

SafetyNet has developed a safety performance indicator (SPI) for drugs: the percentage of fatalities resulting from accidents involving at least one driver impaired by drugs other than alcohol. Up to now, only seven countries (of which five EU Members) provided the data to calculate the value of this performance indicator (illustrated in the following Table 9), but these figures should be considered as an example of the drug SPI rather than comparable figures, since only Spain and Switzerland list the drugs tested for, i.e. both medicinal and illegal drugs. It should also be reminded that this figure is likely to yield an overestimation of the indicator value (SafetyNet, 2008).

The use of psychoactive substance is of particular concern especially for young drivers, for whom often there is a cumulative impact with alcohol.

*Table 9: Killed drivers impaired by drugs as percentage of all killed drivers*

Country	Year	Drug SPI
BE	2002	0.9
CZ	2004	0.1
ES	2006	11.8
CY	2006	8.1
FI	2005	1.8
NO	2006	8.0
CH	2005	7.6

*Source: SafetyNet, 2008*

### 4.4.3 Fatigue

Statistics on driver fatigue are available only for professional hauliers. The European Truck Accident Causation Study (ETAC, 2007) has studied the main causes of accident involving road professional hauliers. The results of the study concerning driver fatigue are illustrated in Table 10, where the percentage of accidents where the main cause is fatigue and according to the origin of the accident is estimated.

However, it must be stated that it is difficult to prove that fatigue is the main cause of the accident, because there are various stages of vigilance, from slight fatigue to sleeping, and fatigue is often linked to other causes such as being inattentive. Moreover, experts may only base their judgement on what the drivers or witnesses told them, since an objective test for fatigue does not exist.

Based on the 624 accidents in the database, on average fatigue was the main cause in only 6% of the total accidents involving trucks, 37% of which were fatal.

When fatigue played a role in the accident, 68% of these accidents involved a truck and another vehicle while in 29% of the cases the accident was a single truck accident. Regarding the place of accidents where fatigue is the main cause, nearly 90% happen on highways or on inter-urban roads, while fatigue as an accident cause plays only a minor role in cities.

*Table 10: Percentage of accidents where the main cause is fatigue*

Type of accident	When the truck is the cause of the accident	When the other vehicle is the cause of the accident
Accident in queue	2.3%	5.4%
Accident due to lane departure	1.5%	4.2%
Accident during an overtaking manoeuvre	8.8%	1.3%
Single truck accident	18.6%	n.a.
<b>All accident involving trucks</b>	<b>6%</b>	<b>n.a.</b>

*Source: ETAC, 2007*

The ETAC study concludes that fatigue plays only a minor role in truck accidents.

A comparison of the effects of fatigue on road safety in different period of time in order to evaluate the impact of the actions undertaken in the framework of the RSAP is not provided here, as there is no available data. However, an attempt to evaluate the impact on road safety in terms of fatalities and injuries is provided in the Impact Assessment (Volume 2).

For the specific comments on the single measures please refer to the measure factsheets provided in annex.

## 4.5 Accident protection or passive safety

The actions taken in the framework of vehicle passive safety address different specific issues:

- motorcyclists;
- vulnerable road users (pedestrians and cyclists);
- vehicle occupants' protection, with a special focus on children;
- vehicle crash compatibility.

The analysis will follow this categorization, based on the target of each group of measures. One measure originally included in the category “passive safety” (Measure 20, EuroNCAP) has been analysed separately, within the framework of “building stakeholders’ commitment”. Nevertheless, it is taken into account in the evaluation of the improvements in vehicle passive safety.

An important consideration is that the actual impact of vehicles improvements on road users’ safety largely depends on the age of vehicles and on the rate at which the vehicle fleet is renewed.

According to the European car manufacturers association (ACEA), the average age of cars is eight years in the EU15 and up to 14 years in Central and Eastern European Countries.

Concerning vehicles renewal, the average annual renewal rate of passenger cars in 2007 (i.e. percentage of new cars among all registered passenger cars) was 6.7% in the EU (ETSC, 2009), meaning that the fleet will be totally renewed in about 14 years, if the rate remains constant. Central and Eastern European countries present on average lower renewal rates, also because of the higher importance of second-hand cars.

In general, cost effectiveness of vehicle safety improvements is proven to be very high. Usually the technologies themselves are not hugely expensive, but they have a great impact on injury and fatality reduction (EuroNCAP website).

### *Box 3: Accident protection of passive safety: Stakeholders’ main comments*

According to the stakeholders, overall, all measures on passive vehicle safety covered by the current RSAP shall be continued, in some cases redefined, and further supported. The only exception is represented by the measure on the introduction of universal anchorage systems for child restraint devices, which has been completed.

### 4.5.1 Motorcycles and mopeds

Two measures specifically concern powered two wheels’ (PTW) road safety:

- **Measure 18:** Encourage the general use of crash helmets by all two-wheel motor vehicle users.
- **Measure 35:** Improved motorcycle safety through legislation or voluntary agreements with the industry.

The first one is a very specific passive safety measure, while the second measure addresses the issue in a general way in the framework of the active vehicle safety.

In 2007, the fatalities involving motorcycles or mopeds represented almost the 18% of the total fatalities on the European roads. In particular, motorcycles accounted for about the 14% of all fatalities in the EU27, i.e. about 5,800 deaths; mopeds accounted for about 4% of the deaths, i.e. almost 1,500 deaths. The total social cost associated to fatalities involving powered two wheels is around 11.2 billions Euro.

The increasing participation of powered two wheels to the transport mix is of particular concern. Motorcyclists face a much higher risk of being killed compared to other road users: in fact, the risk of being killed is 18 times higher than for car drivers. And the number of motorcyclists fatalities has been increasing in 11 out of 19 countries (see Table 11). It also should be considered that PTW riders form one of the most vulnerable groups of road users and road accidents involving injuries to them are a major social concern.

*Table 11: Fatalities involving motorcycles and mopeds*

	Year	Moped	Motor cycle	TOTAL	Year	Moped	Motor cycle	TOTAL	TOTAL 2007-2001
PT	2007	71	145	216	2001	184	229	413	-91.2%
FR	2007	324	853	1,177	2001	450	1,092	1,542	-31.0%
BE	2006	36	130	166	2001	63	147	210	-26.5%
NL	2007	60	64	124	2001	78	76	154	-24.2%
LU	2005	0	5	5	2001	0	6	6	-20.0%
AT	2007	24	96	120	2001	37	107	144	-20.0%
LV	2007	4	10	14	2006	6	10	16	-14.3%
EL	2007	43	420	463	2001	77	426	503	-8.6%
UK	2007	18	596	614	2001	14	580	594	3.3%
ES	2007	233	640	873	2001	461	370	831	4.8%
IT	2007	358	1,182	1,540	2001	578	848	1,426	7.4%
IE	2003	0	55	55	2001	0	50	50	9.1%
MT	2007	0	4	4	2005	0	3	3	25.0%
HU	2007	31	112	143	2003	36	66	102	28.7%
CZ	2007	3	136	139	2001	9	86	95	31.6%
DK	2007	48	36	84	2001	43	12	55	34.5%
SE	2007	14	60	74	2001	9	38	47	36.5%
FI	2007	11	32	43	2001	7	16	23	46.5%
EE	2007	4	10	14	2005	2	5	7	50.0%
AVERAGE VARIATION (calculated only for the 12 countries with both data 2001 and 2007)									-6.6%

Source: CARE

The MAIDS investigation studied in depth accidents involving powered two wheels (MAIDS, 2009). Among the major findings, it emerged that, as far as exposure data are concerned, 18 to 25 year old riders were found to be over-represented, indicating the special attention that young drivers deserve also in relation to this mode of transport.

**Box 4: Motorcycles and mopeds: Stakeholders' main comments**

On the one side, the consulted stakeholders rated the advancement on the use of crash helmets by all two-wheel motor vehicle users as “medium”. On the other hand, this measure is regarded as being very promising in terms of effectiveness, efficiency and sustainability. Consequently, stakeholders believe this measure should be continued into the new ERSAP, and further backed with research for assessing improvement of current helmet standards and reduction of VAT on protective equipment.

For the specific comments on the single measures please refer to the measure factsheet provided in this study.

#### 4.5.2 Vulnerable road users

Pedestrians and cyclists suffer the most severe consequences in collisions with other road users because they cannot protect themselves against the speed and mass of the other party involved. This is why they have been identified as vulnerable road users (VRUs). Two measures aim at reducing deaths and injuries of this particular group:

- **Measure 19:** Study the effectiveness of crash helmet use by cyclists in different age groups, as well as the impact on bicycle use and the measures to be taken, where appropriate, at EU level.
- **Measure 23:** Improve cars to reduce the severity of accidents involving pedestrians and cyclists.

The first measure involves a very specific study on the effectiveness of crash helmets, which, at present, led to no conclusion and was temporary suspended. The second measure concerns technical requirements for the construction of vehicles in order to reduce the severity of injuries of vulnerable road users hit by them.

The ETSC calculated that the risk of being killed per kilometre travelled for pedestrians and cyclists is respectively nine and seven times higher than for car occupants (ETSC, 2003).

In 2007, the fatalities of pedestrians and cyclists represented 19.9% and 6.5% of the total deaths on European roads<sup>23</sup>, respectively. This means that about 8,500 pedestrian and almost 2,800 cyclists died in one year, costing to society 12.9 and 4.2 billions Euro respectively, for a total of 17.1 billions Euro.

Table 12 illustrates the percentage variations of the fatalities involving VRUs. The percentage should be considered with care, since the underlying values are rather small, and consequently they produce wide

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<sup>23</sup> CARE data.

variations. Nevertheless, it is useful to look at the sign of the variation, to understand if the number of fatalities has been increasing or decreasing.

It appears that, on average, cyclists' and pedestrians' fatalities decreased by 21% and 19% respectively in the EU27. In the large majority of the countries the number of fatalities have been decreasing both for pedestrians and cyclists. The sole exceptions are represented by the trend of cyclists' fatalities in Cyprus and Romania and by the trend of pedestrian fatalities in Germany, Cyprus, Austria, Romania and Slovakia. Therefore it may be concluded that road safety of the most VRUs have been increasing, even if further improvements are more than desirable.

**Table 12: Fatalities of pedestrian and cyclist, percentage variation**

	<b>Cyclist</b>	<b>Pedestrian</b>
BE	-32%	-35%
BG	-22%	-12%
CZ	-18%	-28%
DE	-4%	39%
EE	-28%	-41%
IE	-25%	-9%
EL	-45%	-25%
ES	-10%	-30%
FR	-45%	-32%
IT	-4%	-39%
CY	100%	12%
LV	-55%	-15%
LT	-20%	-8%
LU	0%	-45%
HU	-19%	-19%
MT	-100%	-40%
NL	-25%	-19%
AT	-33%	11%
PL	-17%	-3%
PT	-32%	-54%
RO	23%	2%
SI	0%	-21%
SK	-33%	1%
FI	-63%	-23%
SE	-23%	-33%
UK	-1%	-23%
<b>EU27</b>	<b>-21%</b>	<b>-19%</b>

Source: CARE

Age groups that have the highest percentage of pedestrian fatalities are children younger than 10 years and adults over 65 years. Cyclist fatalities have the highest share among children between 6 and 14 years of age (ERSO, 2007).

Most accidents to pedestrians and cyclists occur in urban areas. Motor vehicles (cars, lorries, and buses) account for over 80% of vehicles striking pedestrians and cyclists (ERSO, 2007). It is interesting to notice that crashes involving pedestrians and cyclists occur frequently at facilities designed specifically for them, such as pedestrian crossings, cycle tracks, or cycle lanes. This may signify that these facilities should be improved, but also that they might be simply on locations where roads most often cross.

Factors that have been identified by literature as contributing factors in the causation of pedestrian and cyclist crashes and injuries are the speed of the other vehicles, vehicle control and alcohol consumption, the weight and design of motor vehicles, the lack of protection of pedestrians and cyclists and their visibility.

Given the evidence illustrated in this Chapter, it is recommendable to continue giving a special focus to these two categories of road users.

### 4.5.3 Vehicle occupants' protection

Five RSAP measures are aimed at increasing the protection of vehicles occupants, two of which are specifically targeted at children:

- **Measure 21:** Develop a harmonised specification for the installation of audible or visual seat belt reminder systems and promote their universal use by voluntary agreement.
- **Measure 22:** Introduce universal anchorage systems for child restraint devices.
- **Measure 24:** Study the causes of and ways of preventing whiplash injuries.
- **Measure 25:** Support the development of smart restraint systems.
- **Measure 55:** Introducing protection rules for vehicles regularly used for the carriage of children.

They all concerns technical specifications in the domain of vehicle passive safety.

In 2007, on average about 80% of the fatalities concerned vehicle occupants (60% the driver and 20% the passengers). On the whole, about 26,800 drivers and 8,500 passengers lost their lives on EU roads in 2007, for a total social cost of 52.3 billions Euro.

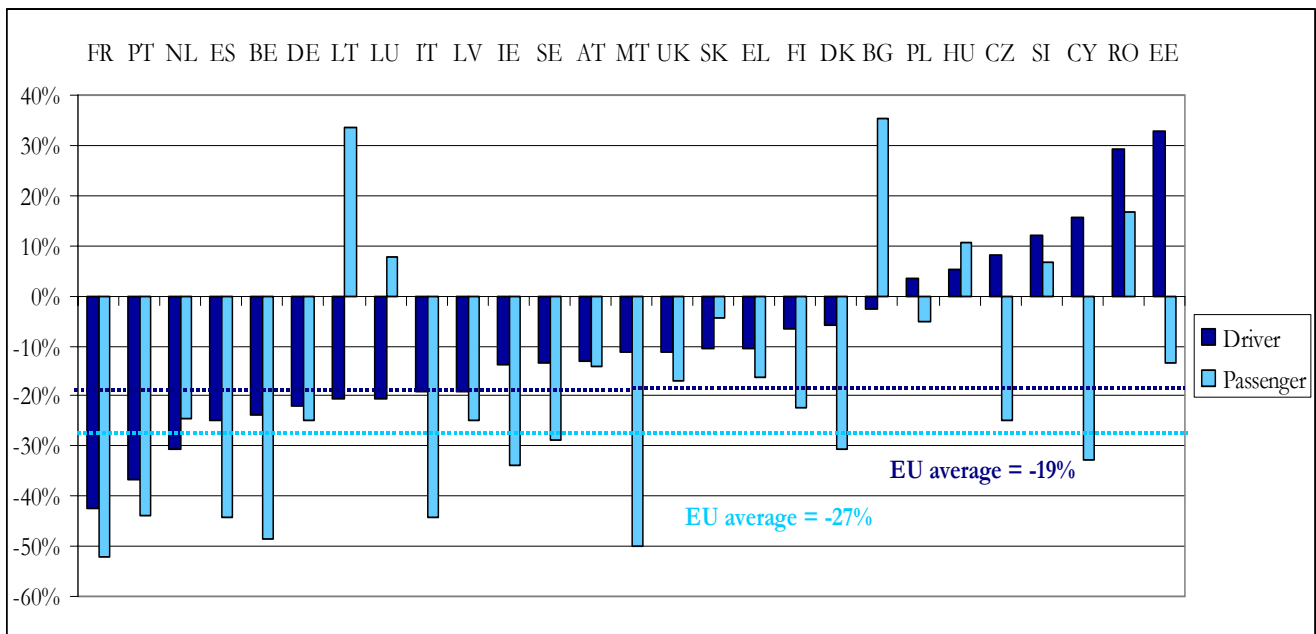
Looking at the change in vehicles occupants' fatalities between 2001 and 2007 it may be observed that occupants' safety has been increasing. On average, deaths involving drivers and passengers decreased by 19% and 25% respectively.



Figure 26 illustrates the percentages variation of the drivers and passengers' fatalities in each country, confirming the improvements in car occupants safety. Looking at the data, one should take into account that the variation values are useful only for what concerns the indication of the trend (increasing or decreasing). The size of the variation is not comparable, since the underlying values are very different.

There are only seven countries presenting an increasing mortality of car drivers (Estonia, Romania, Cyprus, Slovenia, the Czech Republic, Hungary and Poland) and six countries presenting an increasing mortality of car passengers (Bulgaria, Lithuania, Romania, Hungary and Slovenia). However, the underlying values are quite small for these Member States, and therefore the percentage variation is not very significant.

**Figure 26: Car occupants' fatalities, 2001 and 2007 percentage variation <sup>24</sup>**



Source: CARE

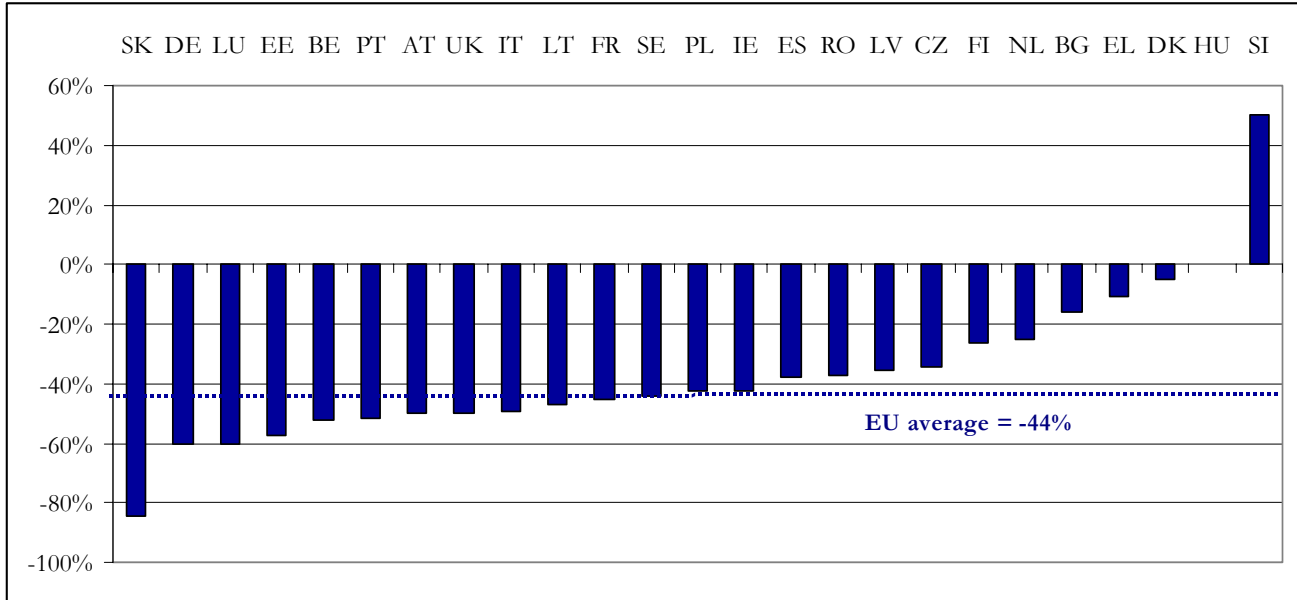
The ETSC has calculated that improvements in occupants protection has contributed preventing about 5,470 fatalities since 2001 (ETSC, 2009), bringing a social benefit to society of more than 8.3 billions Euro (assuming the value of a statistical life calculated by the HEATCO study, 2006).

#### 4.5.3.1 Children

Assuming the ETSC estimates according to which around 40% of children road fatalities occurs in cars (ETSC, 2009), and given that total children road fatalities reached about 1,200 in 2007, it may be calculated that that around 470 children lost their life when travelling by car in the EU27.

Figure 27 and Table 13 present the road mortality among children aged between 0 and 14 year old in 2007 and in 2001. It emerges a remarkable reduction in all the European countries for which data are available, with the exception of Slovenia.

**Figure 27: Children fatalities, 2007 and 2001<sup>25</sup>**



Source: CARE

<sup>25</sup> Data for CY and MT are not available. Data for BG, CY, DE, MT, LT, SI, SK are CARE estimates.

**Table 13: Children road fatalities, 2007 and 2001<sup>26</sup>**

	2007	2001	Years, if different	% Variation
AT	13	26		-100,0%
BE	32	63	2006-2001	-96,9%
CZ	25	38		-52,0%
DK	20	21		-5,0%
EE	6	12	2007-2005	-100,0%
ES	99	160		-61,6%
FI	14	19		-35,7%
FR	150	273		-82,0%
EL	42	47		-11,9%
HU	37	32	2007-2003	13,5%
IE	16	26	2003-2001	-62,5%
IT	95	187		-96,8%
LU	4	5	2005-2001	-25,0%
LV	11	14	2007-2006	-27,3%
NL	36	48		-33,3%
PL	167	n.a.	2005	n.a.
PT	27	56		-107,4%
RO	117	187		-59,8%
SE	10	18		-80,0%
UK	91	185		-103,3%
EU27				-44%

Source: CARE

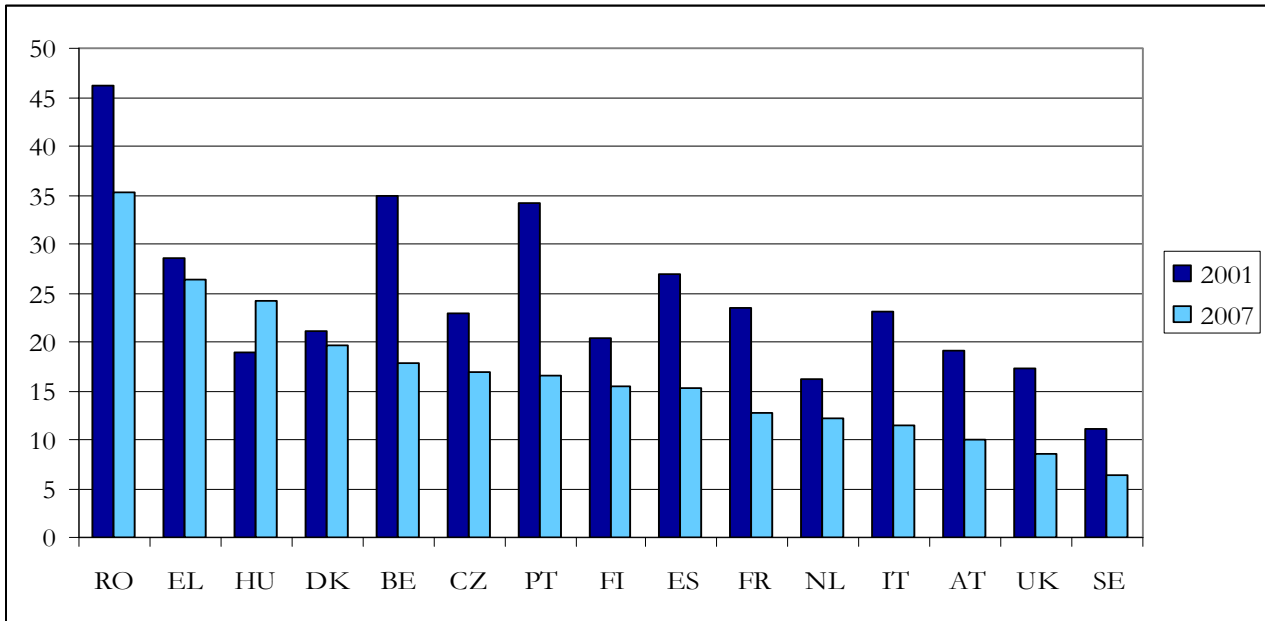
ETSC (2009) confirms that road safety has considerably improved, even faster than road safety for the rest of the population, indicating that the measure specifically addressing children safety had indeed a positive impact with a good degree of effectiveness.

In Figure 28 the fatality risk for children per million inhabitants aged between zero and 14 years old is reported. Varying from about 5 to 35 deaths per million inhabitants (for the countries with available data), the children road fatality risk is well below the average risk for the general population (86 fatalities per million inhabitants in 2007). Again, a remarkable reduction can be observed between 2007 and 2001 (-40% on average, see Figure 29 in this respect), with the exception of Hungary..

Clearly, there is still place for improvements: half of the children fatalities could be avoided simply if the child mortality risk from vehicle collision were the same as in Sweden, the best performing country (ETSC, 2009).

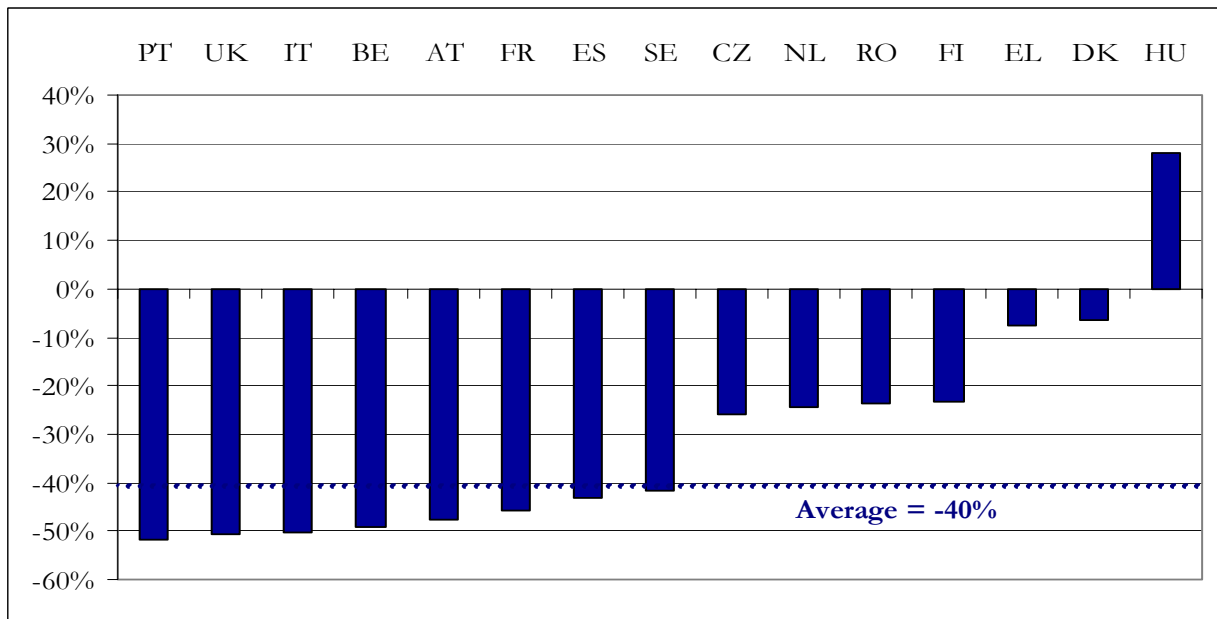
<sup>26</sup> Data for BG, CY, DE, MT, LT, SI, SK are not available.

Figure 28: Children road fatalities per million inhabitants, 2001 and 2007<sup>27</sup>



Source: TRT elaboration on CARE data

Figure 29: Children road fatalities per million inhabitants, 2007 and 2001 (%) <sup>28</sup>



Source: TRT elaboration on CARE data

For the specific comments on the single measures please refer to the measure factsheets provided in this study.

<sup>27</sup> Data for HU refer to years 2007-2003; data for BE to years 2006-2007-

<sup>28</sup> Data for HU refer to years 2007-2003; data for BE to years 2006-2007-

#### 4.5.4 Vehicle crash compatibility

In the framework of vehicle passive safety, three measures specifically aim at increasing vehicle compatibility in case of accident:

- **Measure 26:** Adapt to technical progress the front, side and rear-end impact directives for lorries to limit vehicle under-run, and introduce energy absorption criteria.
- **Measure 27:** Make vehicles more compatible.
- **Measure 28:** Examine the impact on road safety of the proliferation of 4x4s, sports utility vehicles and multi-purpose vehicles.

The first measure (Measure 26) concerns a very specific technical specification, while the second one (Measure 27) has a more general scope. The third measure (Measure 28), instead, aims at providing a knowledge basis to develop, in a second step, the suitable actions to increase vehicle compatibility regarding at particular categories of vehicles.

Crash compatibility is assessed by EuroNCAP, which provides useful information about frontal and side crashes between vehicles of similar structure. Through time, EuroNCAP has seen large improvements in frontal and side impact performance. Out of 29 vehicle tested in 2001, the maximum rating (five stars) was given only to two cars, while attributed four and three stars to 16 and 11 vehicles respectively. Instead, in 2009 the vehicles rating five stars were 26 out of 30 (three cars rated four stars and only one three stars). This, and given the simultaneous increase over the years in the number of items on which tests are performed, further confirms the significant technological advancement achieved by the car industry in the field of road safety.

It may be, therefore, concluded that the design and new developments of vehicles have been largely improved to increase safety in case of collision. Not surprisingly, the actual impact on road users safety depends on the age of vehicles and on the rate at which the vehicle fleet is renewed.

Since statistics show that the frequency of dying in cars increases dramatically with the age of the vehicle, the purchase of new cars with safety equipments may be encouraged, for example through incentives.

##### ***Box 5: Vehicle crash compatibility: Stakeholders' main comments***

Stakeholders have paid a particular attention on the measure related to the need of making vehicles more compatible. It has been underlined the fact that vehicles should not only be designed for a barrier impact, as is the case today, but also for vehicle-to-vehicle collisions. Furthermore, a test to evaluate the safety characteristics of small vehicles versus large vehicles should be introduced, in order to optimise the vehicle structure and to reduce the risk of injuries.

Compatibility issues are becoming increasingly important due to the diversification of vehicle concepts and sizes, which implies that efforts and research in this direction shall be continued with a focus on passenger cars and light commercial vehicles.

For the specific comments on the single measures please refer to the measure factsheets provided in annex.

## 4.6 Accident prevention or active safety

Intelligent transport and active safety systems may provide a considerable contribution to road safety by preventing crashes from occurring. The RSAP contains the following measures regarding the active safety domain:

- **Measure 29:** Examine the wide-scale use of daytime running lights on all vehicles.
- **Measure 30:** Improve the visibility of heavy duty vehicles.
- **Measure 31:** Eliminate blind spots towards the rear for drivers of heavy duty vehicles.
- **Measure 32:** Assess measures to reduce tyre-related accidents.
- **Measure 34:** Examine national trials of intelligent speed adaptation devices and assess their acceptability to the public.
- **Measure 36:** Examine the benefits of harmonising the approval of adaptations to vehicles for persons with reduced mobility.
- **Measure 37:** Adopt a long-term plan concerning information and communication systems in the field of road safety and establish the necessary regulatory framework for implementing such systems.
- **Measure 38:** Identify priority areas for the development and implementation of performance standards to optimise the man-machine interface and the road safety potential of telematic applications. Ensure compliance with the declaration of principles concerning the human-machine interface.
- **Measure 39:** Examine, together with the Member States, the need to include new onboard electronics systems in roadworthiness testing.
- **Measure 40:** Determine and encourage best practices so as to improve the efficiency of periodic compulsory inspections at the lowest cost.

The actions for the active safety are manifold. Measures 29, 30, and 31 regard the visibility of passengers cars and heavy duty vehicles. Measures 32, 34, 37, and 38 are linked with the development of systems and instruments for helping drivers to avoid accidents and making easier the driving task. Measure 36 is focused on the persons with reduce mobility, while Measures 39 and 40 are linked to the field of testing and technical inspections.

It should also be pointed out that the active safety field in RSAP includes also the Measure 33 and 35 regarding detection devices and motorcycle safety respectively. However for the purposes of the study such measures were considered in sections 4.4 and 4.5.1 respectively.

As previously mentioned, the implementation of a specific measure and its impact on road safety is usually linked to the development of other measures in different domains. Sometimes the

implementation of a certain measure needs to consider the activities in complementary road safety fields. In particular, the actions for active safety of vehicles are strictly connected with measures undertaken in the domain of road infrastructures. Besides, the combined development of active and passive safety measures would have an even higher potential in improving road safety.

Even if there are some exceptions, the mentioned measures show a high level of implementation. However, in most cases a quantitative evaluation of their effectiveness and efficiency may not be performed, since such measures have only an indirect impact on road safety. Despite that, some important considerations may be drawn. In particular, the importance of active safety measure is to be found in respect to the high proportion of accidents caused by human error.

For the purpose of providing some indication regarding the impact of the human error among road crashes causes, the European Truck Accident Causation Study (ETAC, 2006) may be mentioned. According to this study, in 85.2% of the investigated accidents the cause is linked to human error of one of the road participants (truck driver, car driver, pedestrians etc). Also in the framework of the MAIDS investigation (see also section 4.5.1), the human factor emerged as the main cause of accidents involving powered two wheels (PTW). Human factors were the primary accident contributing factor in approximately 87.9% of all the analysed cases (with the component regarding PTW riders equal to 37.4% and vehicle operators equal to 50.5%).

Therefore actions in the active safety field limiting the human error could play a considerable role in reducing the number of road accidents. In addition, since the constant growth of circulating vehicles, decreasing road accidents through active safety actions is even more challenging. So, on the basis of these considerations, it should be opportune to continue paying attention in the future to actions regarding the active safety of vehicles.

With regard to sustainability, it is reasonable to assume for such kind of measures positive effects lasting in the medium and long term.

***Box 6: Accident prevention of active safety: Stakeholders' main comments***

Among the stakeholders' feedbacks, the measures referring to the wide-scale use of daytime running lights on all vehicles and the elimination of blind spots towards the rear for drivers of heavy duty vehicles have been the most commented.

Concerning the first measure, stakeholders generally agree on a high level of advancement. Here, the EU has introduced a large-scale deployment of daytime running lights (DRL) on all new types of passenger cars and small delivery vans as from the 7th of February 2011 and for trucks and buses as from August 2012. The measure also proves to be effective and efficient, since, although the measure proposed by the European Commission will only slowly trickle through the whole car fleet as it only address new vehicles, the regulation will oblige all car manufacturers to install dedicated DRL systems on the sold vehicles as from 2011, so guaranteeing a rapid deployment. Finally, in the long-term, better visibility of vehicles is expected to significantly reduce the number of accidents.

As for the second measure, all rear view mirrors have been redesigned to cover larger fields of view, front mirrors have been introduced and retrofit measures for existing vehicles defined as well. On the whole, the

effects of this measure are evaluate as “medium”, therefore it is considered that this measure shall be further continued into the new RSAP.

For the remaining measures, the evaluation made by the stakeholders is positive, showing a good level of generated effects in terms of effectiveness, efficiency and sustainability. Again, as for the passive safety measure, further research is needed , as well as to embed these measures into the new ERSAP as well.

For the specific comments on the single measures please refer to the measure factsheets provided in annex.

## 4.7 Road infrastructure

The RSAP includes seven measures aimed at increasing the safety of road infrastructures. In particular the following measures have been taken into account:

- **Measure 41:** Submit a proposal for a framework directive on road infrastructure safety with a view to introducing a system for the harmonised management of black spots and road safety audits for roads on the trans-European network.
- **Measure 42:** Draw up technical guidelines concerning infrastructure, notably for low cost measures, audit methods, urban safety management, speed moderation techniques and forgiving roadsides.
- **Measure 43:** Draw up good practice guidelines for level-crossing safety.
- **Measure 44:** Assess the safety impact of projects receiving Community funding and concerning an entire area.
- **Measure 45:** Adapt to technical progress the Community standards applicable to road equipment and ensure a high level of protection, notably by making road sides less hazardous in the event of an accident.
- **Measure 46:** Carry out research and demonstration projects on ‘intelligent roads’.
- **Measure 47:** Achieve a high level of safety in tunnels, notably through standards and user information.

The contents and the objectives of these measures are various. Some measures address specific issues such as safety in tunnels (Measure 47), level-crossing safety (Measure 43) and the development of the concept of “intelligent roads” (Measure 46). Some concern technical specifications regarding road infrastructures and their equipment (Measure 42 and 45), while Measures 41 regards the emanation of a directive in order to achieve an higher and more homogeneous level of safety across the Trans-European Network. Measure 44 may be considered as a monitoring and evaluation measure, since it focuses on the assessment of the impact on road safety of different project alternatives.

It is noteworthy to mention that some actions regarding the infrastructures safety are linked with the field of active safety of vehicles. For example, the functioning of intelligent speed adaptation devices (see Measure 34) is linked with the speed limits established for road infrastructures. Intelligent vehicle



systems needs to communicate with the environment in which vehicles circulate (see Measure 37) and hence the features of road infrastructures should be properly taken in account. At the same time the development of intelligent roads depends on the technology available for implementing communication systems on vehicles.

Nowadays almost all measures show a “low” or “medium” level of advancement. In addition their effectiveness and efficiency may not be evaluated quantitatively, since such measures have only an indirect impact. Conversely, the mentioned measures are expected to potentially give a high contribution to road safety with long-lasting effects. Therefore it is recommended to continuing and deepening such measures in the new ERSAP.

***Box 7: Road infrastructure: Stakeholders’ main comments***

According to the stakeholder consultation, the level of advancement is generally evaluated as “low” or “medium”, with the exception of the measure on the safety standards for tunnels. For such measure, the impact in terms of effectiveness, efficiency and sustainability is positively graded: in fact, numerous European road tunnels have been refurbished and modernised following the requirements of the Directive about the safety of tunnels adopted in 2005.

On the contrary, concerning the measure on a framework directive on road infrastructure safety with a view to introducing a system for the harmonised management of black spots and road safety audits for roads on the Trans-European Network, advancement is still low since Member States are implementing their own audit schemes, though not harmonised. Moreover, the Directive on Road Infrastructure Safety Management has only been recently adopted (in 2008), which implies that it will shows its effects on a long-term basis. Importantly, the Directive addresses the TEN roads, which are generally the safest roads, without addressing on the longer term the higher problem which is tied to rural roads (which are the most dangerous). Therefore this measure should be redefined within the new ERSAP and a European harmonisation process will be needed.

Similarly, a low advancement has been pointed out in the case of the measure on the low cost measures, audit methods, urban safety management, speed moderation techniques and forgiving roadsides, and on research and demonstration projects on “intelligent roads”.

In the first case, the results achieved so far by the various research projects are insufficient, while in the second case the ITS deployment infrastructure has proved to be costly. Therefore, and given the expected high effects these measure may generate, stakeholders generally agree on a need for continuing and redefining these measures into the new ERSAP, by for instance enhancing technical guidelines on roads observing and fulfilling vision zero expectation, or including cooperative systems.

Finally, two measures are also worthy of being included into the new ERSAP:

- assessing the safety impact of projects receiving Community funding and concerning an entire area;
- adapting to technical progress the Community standards applicable to road equipment and ensure a high level of protection, notably by making road sides less hazardous in the event of an accident.

For both the impact is estimated as important in terms of efficiency, effectiveness and sustainability.

For specific comments on the single measures please refer to the measure factsheets provided in Annex 1.2.

## 4.8 Professional drivers

Seven measures have addressed the road safety issues related to the domain of the professional drivers:

- **Measure 48:** Adoption and incorporation in national legislation of a European Parliament and Council directive on the training of commercial drivers.
- **Measure 50:** Installation of digital tachographs in commercial vehicles.
- **Measure 51:** Best practice guidelines concerning company policies.
- **Measure 52:** Best practice guidelines concerning the securing of loads and the carriage of exceptional loads.
- **Measure 53:** Adapting to technical progress the Community legislation concerning the carriage of hazardous goods.
- **Measure 54:** Making the wearing of seatbelts mandatory in coaches and heavy goods vehicles.
- **Measure 56:** Examining the impact on road safety of the growing use of small commercial vehicles and company vehicles.

Over the last eight years, as shown in Table 14, there has been a general reduction in the number of fatalities related to commercial vehicles, for what concerns both lorries under <3.5 tons (-22.2% during the period 2001-2007), and Heavy Goods Vehicles (HGVs, -4.9% during the period 2001-2007). Looking at the Table, one should take into account that the period of reference is not always the same across EU Member States: though in the majority of countries 2001 is generally the base year, the year with the latest available data is often different. This applies in particular for the new Member States, where data are in many case not available at all.

**Table 14: Trend in the fatalities for HGVs and lorries under 3.5 ton<sup>29</sup>**

Country	Period of reference	HGVs (2001 or oldest year available)	HGVs (2007 or latest year available)	Trend for HGVs	Lorries <3.5 t (2001 or oldest year available)	Lorries <3.5 t (2007 or latest year available)	Trend for Lorries <3.5 t
BE	2001-2006	28	16	-42.9%	48	34	-29.2%
BG	2007	53	n.a.	n.a.	n.a.	n.a.	n.a.
CZ	2001-2007	22	21	-4.5%	27	45	66.7%
DK	2001-2007	2	4	100%	22	24	9.1%
DE	2007 (e)	n.a.	69	n.a.	n.a.	106	n.a.
EE	2005-2007	7	3	-57.1%	0	0	0.0%
IE	2001-2003	6	8	33.3%	20	18	-10.0%
EL	2001-2007	28	14	-50.0%	94	56	-40.4%
ES	2001-2007	151	90	-40.4%	324	234	-27.8%
FR	2001-2007	143	68	-52.4%	79	131	65.8%
IT	2001-2007	59	25	-57.6%	96	25	-74.0%
CY	2007	n.a.	0	n.a.	n.a.	4	n.a.
LV	2006-2007	13	12	-7.7%	n.a.	n.a.	n.a.
LT	2007	n.a.	11	n.a.	n.a.	n.a.	n.a.
LU	2001-2004	1	0	-100%	n.a.	n.a.	n.a.
HU	2003-2007	14	15	7.1%	31	47	51.6%
MT	2005-2007	0	0	n.a.	5	0	-100%
NL	2001-2007	16	7	-56.3%	42	35	-16.7%
AT	2001-2007	14	11	-21.4%	25	15	-40.0%
PL	2005 (e)	n.a.	217	n.a.	n.a.	n.a.	n.a.
PT	2001-2007	30	25	-16.7%	137	70	-48.9%
RO	2001-2007	145	130	-10.3%	n.a.	n.a.	n.a.
SI	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
SK	2007	n.a.	16	n.a.	n.a.	n.a.	n.a.
FI	2001-2007	6	7	16.7%	9	12	33.3%
SE	2001-2007	5	6	20.0%	15	9	-40.0%
UK	2001-2007	54	63	16.7%	68	58	-14.7%
EU27	2007	n.a.	1057	-4.9%	n.a.	900	-22.2%

Source: CARE data

Certainly, some major issues, like for example work intensity and related stress, fatigue, driving times and rest periods, are of concern for professional drivers, which have a direct impact on road safety as well. Drivers face increasingly tight delivery schedules that have to fit in with “just-in-time” operations. This creates more time pressure for drivers and a constant feeling of being in a hurry. When referring to fatigue, there is some evidence (Adams-Guppy et Guppy, 2003) suggesting that driving fatigue represents a significant element of risk for about 10% of drivers. Moreover fatigue is a particular

<sup>29</sup> Data from BG, DE, CY, LT, Ro, SI and SK are not available.

problem especially for truck drivers, since the particular job demands of the long-haul transport industry often interfere with normal rest.

With respect to this field of action, the measures covered by the current RSAP have been translated into several (and sometimes also cross-cutting) legislation acts, among them: (i) Directive 2006/22/EC<sup>30</sup>, (ii) Regulation (EC) 561/2006<sup>31</sup>, (iii) Regulation (EC) 2135/98 as amended by the Regulation (EC) 1360/2002<sup>32</sup>, and (iv) Directive 2001/26/EC<sup>33</sup>, are particularly worth of mentioning.

Specific attention has been paid to the transport of dangerous goods where the number of checks has been increased with regards to a set of main aspects, such as compliance in terms of:

- speed and loading limits;
- cargo securing;
- social legislation on road transport activities;
- provisions for dangerous goods.
- roadworthiness of vehicles.

Cooperation among Member States is also a mechanism that has enabled to put in place a more systematic approach on enforcement of road safety at EU level.

Check procedures and penalties vary among Member States. For the former, Member States have generally moved along the direction of setting by law a minimum level, although it is important to point out that the relationship between checks and offences is not necessarily linear (more checks usually leads to a reduction in offences, but less checks does not necessarily imply more offences, since the latter may be constrained by other deterring enforcement schemes). For the latter, the existing EU norms do not foresee a unique system of penalties. Four groups of penalties are normally applied in the Member States: warning, fine, prosecution and prison sentence. Here, the critical issue is not related to the degree of severity of the penalty, but rather the probability of being checked and fined.

Tables 15 and 16 illustrate the best and worst performing EU countries with regard to number of checks and the probability of being checked in the case of transport of dangerous goods.

***Table 15: Best and worst performing countries in relation to the number of checks***

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<sup>30</sup> Directive 2006/22/EC of the European Parliament and of the Council of 15 March 2006 on minimum conditions for the implementation of Council Regulations (EEC) No 3820/85 and (EEC) No 3821/85 concerning social legislation relating to road transport activities and repealing Council Directive 88/599/EEC (Text with EEA relevance) - Declarations

<sup>31</sup> Regulation (EC) No 561/2006 of the European Parliament and of the Council of 15 March 2006 on the harmonisation of certain social legislation relating to road transport and amending Council Regulations (EEC) No 3821/85 and (EC) No 2135/98 and repealing Council Regulation (EEC) No 3820/85.

<sup>32</sup> Commission Regulation (EC) No 1360/2002 of 13 June 2002 adapting for the seventh time to technical progress Council Regulation (EEC) No 3821/85 on recording equipment in road transport (Text with EEA relevance).

<sup>33</sup> Directive 2001/26/EC of the European Parliament and of the Council of 7 May 2001 amending Council Directive 95/50/EC on uniform procedures for checks on the transport of dangerous goods by road.

Aspects	Driving/rest times	Roadworthiness	Dangerous goods
Reference year	2003-2004	2003-2004	2003-2005
Unit	Number of working days checked/number of days	Checked vehicles/traffic	Vehicles checked/stock of vehicles
Best performing MSs (from 1 <sup>st</sup> to 3 <sup>rd</sup> )	Malta	Hungary	Hungary
	Greece	Germany	Slovenia
	Germany	Belgium	Germany
Worst performing MSs (from 3 <sup>rd</sup> last to last)	Netherlands	Luxembourg	Malta
	Sweden	Italy	Slovakia
	Portugal	Greece	Portugal

Source: PriceWaterhouseCoopers, 2008

Table 16: Probability of being checked (transport of dangerous goods)

Member States	Probability of being checked
Czech republic, Germany Hungary and Slovenia	0.6%
Austria, Spain, France, Poland and Sweden	0.2%
Belgium, Finland, Malta and Latvia	0.1%
The UK, the Netherlands, Denmark, Greece, Ireland, Italy, Lithuania, Luxembourg, Estonia, Portugal, Slovakia	0.06%

Source: PriceWaterhouseCoopers, 2008

#### Box 8: Professional drivers: Stakeholders' main comments

Overall, the replies received by the stakeholders concerning the issue of the professional drivers show that a general low degree of advancement has to be reported for most measures in this area, with the exception of the implementation of the digital tachograph.

For the specific comments on the single measures please refer to the measure factsheets provided in annex.

## 4.9 Emergency services and care for road accident victims

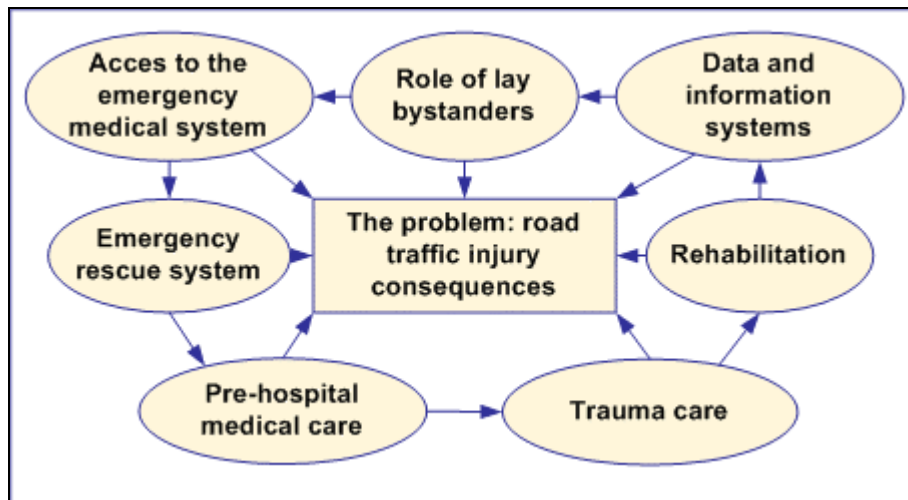
Two measures have addressed the road safety issues related to the domain of the post crash medical care:

- **Measure 57:** Examine best practice with regard to post-accident medical care.
- **Measure 58:** Draw up specifications for satellite-positioning accident-warning systems and carry out demonstration projects involving the whole chain of emergency service provision.

The first measure (Measure 57) refers to an issue of primary concern, which is the post-crash response, that in many case has appeared to be ineffective. In this context, the objective is avoiding preventable

severity of the injury, so to ensure that crash survivor may have the best possible recovery and reintegration into society.

*Figure 30: The chain of help*



*Source: ERSO website*

Over the past years, many projects have been implemented, which made it possible to identify numerous best practices, as also stressed by the SUPREME project. Here the main issue is to what extent these best practices are transferable to other countries in order to be successfully implemented with clear benefits for post accident care.

The second measure (Measure 58) addresses the so-called “eCall” system, whose main purpose consist in providing automated messages to the emergency services in the case of a road crash where the precise location may be identified. The final goal is to reduce the time between when the crash occurs and when medical services are provided, so to reduce the effects of injury consequently.

Several potential benefits are expected from such system, and in particular an average estimate of 4-8% in the number of reduced accident fatalities has been computed by several studies conducted in the various EU Member States (ERSO website). From its perspective, the EC has estimated a potential reduction of 2,500 annually through the implementation of the eCall system (ERSO website).

At present, even more car manufacturers are testing vehicles with the eCall system, where the key issue is mainly represented by the requirement of common standards and communication protocols, as well as of the content and format of the minimum set of data (MSD).

The full introduction of eCall as a standard option for all vehicles type-approved is expected from 2010 onwards.

For the specific comments on the single measures please refer to the measure factsheets provided in annex.

#### 4.10 **Accident data collection, analysis and dissemination**

The RSAP contains several measures intended for (i) improving the statistics on road safety and (ii) ensuring an effective monitoring of the initiatives carried out in this domain.

Specifically, the following measures set general or specific targets in the field of **monitoring and evaluation**:

- **Measure 2:** Evaluate the progress made, compared with the target, by means of appropriate performance indicators at Community and national levels.
- **Measure 3:** Provide a report in 2005 on monitoring of the target, action carried out and modifications needed as a result of enlargement and, where appropriate, propose new measures.
- **Measure 5:** Propose the introduction of harmonised road safety criteria in public service contracts.
- **Measure 7:** Set up a European Road Safety Observatory within the Commission.

The first measure (Measure 2) consists of a general expression of intents, as it defines the approach adopted by the EC for supporting policy assessment, development and implementation. The second measure (Measure 3) is an operational objective setting a very specific target (carrying out a mid-term evaluation). The third measure (Measure 5) aims at including an harmonised safety impact assessment in public service contracts, while, finally, the fourth measure (Measure 7) is an EC initiative targeted at developing a practical mean for gathering and disseminating the relevant information for the accomplishment of the RSAP.

By contrast, the following measures concern directly the collection of **statistical data**, with the objective of broadening the knowledge base in the domain of road safety:

- **Measure 59:** Develop the CARE database and widen access to it, in the interest of achieving greater transparency and encouraging its use; expand CARE to include hazard exposure variables and the causes of accidents.
- **Measure 60:** Assess and improve systems for linking hospital data and national road accident statistics.
- **Measure 61:** Develop specifications for on-board accident recording devices, and examine the consequences of various alternatives for certain categories of vehicles.
- **Measure 62:** Establish a European methodology for independent road accident investigations and set up a group of independent experts meeting within the Commission.

With this regard, Measure 59, in this case too, consists of a general expression of intents, while the three following actions are functional to the above, aiming at the collection and development of specific data on road accidents.

Concerning effectiveness and efficiency, a quantification of the impact on road safety of all the measures mentioned above is not applicable, since they produce only an indirect impact. Nevertheless, it is undoubted the fundamental role covered by this monitoring actions in order to improve road safety, by supporting policy making and evaluation.

With regard to sustainability, the gathering of reliable and exhaustive statistical information may contribute to policy development not only in the short, but also in the long term. In fact, disposing of complete series of data covering long periods of time is necessary for carrying out the research activity.

Over the last years, improvements in road safety statistics have been remarkable, together with the enhancement of the monitoring activity, which today dispose of numerous new indicators and observed variables.

Nevertheless, a lot still needs to be done to complete the information in cooperation with the Member States. Moreover, the results of the various thematic studies in the field of monitoring and statistics still need to find a wide application.

***Box 9: Accident data collection, analysis and dissemination***

Stakeholders also confirm that, despite the results achieved by projects like SafetyNet which have greatly improved the availability and quality of European statistics, many efforts still need to be done to get a harmonised set of European road safety statistics.

Above all, a stakeholder pointed out that the reported statistical information should be more detailed in order to facilitate better analysis, by including for example the type of road on which the accidents have occurred, the gender and age of the involved road users as well as the weather circumstances and time of day.

For the specific comments on the single measures please refer to the measure factsheets provided in annex.

#### **4.11 Building stakeholders' commitment**

Building awareness and engagement in the private sector is extremely important in order to implement and enhance the actions in the domain of road safety. Three measures of the RSAP aim at raising the involvement of the relevant stakeholders:

- **Measure 4:** Invite all parties concerned to sign a European Road Safety Charter.
- **Measure 6:** Study, together with the European haulage industry, additional measures which insurers could take to pass the cost of accident risks on more directly.
- **Measure 20:** The Commission will continue to support EuroNCAP to enable further progress to be made, to raise awareness among and inform consumers and to strengthen the representation of the Member States.



The first measure (Measure 4) concerns the private sector as a whole, including non-governmental organisations (NGOs) active in the field of road safety. All stakeholders dealing with traffic safety are invited to sign specific voluntary commitments to undertake concrete actions to increase road safety. The second measure (Measure 6) addresses specifically the insurance sector, which is invited to participate to the research process together with the EC. Finally, the third measure (Measure 20) targets the automotive sector, namely for what concerns vehicles' passive safety: by testing the collision worthiness of new vehicles and making the results publicly available, EuroNCAP provides an important incentive for the industry to produce safer vehicles.

All these measures are characterized by the fact that they promote the voluntary participation of the targeted stakeholders in order to contribute to the objective of the RSAP, i.e. reducing road fatalities and increasing traffic safety.

Indeed, these measures contributed to implementing a shared responsibility among all the actors involved, indirectly supporting the increase traffic safety and the reduction of road fatalities.

***Box 10: Building stakeholders' commitment: Stakeholders' main comments***

Amongst others, EuroNCAP is considered very successfully by the stakeholders as it has led to a drastic improvement of vehicle design and reduced consequences of accidents on vehicle occupant. It has proved to be very efficient in bringing rapid changes in the addressed areas without passing through a lengthy legislative process which has an uncertain outcome. The work carried out through the EuroNCAP initiative, which has made possible much safer cars in a relative short lap of time, has been much appreciated and should be continued.

To the contrary, rather low impact has been attributed to the implementation of the Road Safety Charter. Even if the stakeholders acknowledge its key role in addressing a wide range of civil society actors, they stress the need to further foster activities that may back and increase the impact of the Charter on civil society.

For the specific comments on the single measures please refer to the measure factsheets provided in annex.

#### **4.12 Research and other projects: a cross-sectional analysis**

This chapter presents a brief cross-sectional analysis of the research activities and the thematic studies funded by the European Commission in the different areas of road safety since 2001.

The implementation of most of the measures of the RSAP has involved research activities and thematic studies in the different areas of road safety. Most of the EU-funded research has concerned industry-oriented projects in R&D, in particular for the development of intelligent vehicles and innovative Information and Communication Technology (ICT) systems, thus to minimize the impact of human error and of difficult environmental conditions. Numerous studies have also aimed at the improvement in the testing of new type of vehicles and at the development of better technical specifications.

Additionally, many thematic studies have collected the best practices in various domains and compared the different initiatives undertaken at national or local level, in order to concretely contribute to policy assessment and development.

Finally, important studies have been carried out to develop and improve the statistics on road safety.

Table 17 gives an overview of the total financial contributions of the EC in the field of road safety, and particularly of DG TREN.

*Table 17: Research activities in the field of road safety funded by the European Commission*

	FP5		FP6		FP7 (1st & 2nd call)		TOTALS	
	Tot (M€)	EC funds	Tot (M€)	EC funds	Tot (M€)	EC funds	Tot (M€)	EC funds
DG TREN	59.07	38.62	60.40	38.12	7.30	5.50	126.77	82.24
DG RTD	60.58	35.09	47.55	29.84	82.49	63.40	190.62	128.33
Infrastructures			28.63	16.24			28.63	16.24
DG INFSO	100.97	53.83	285.97	161.71	145.64	94.45	532.59	310.00
<b>TOTAL</b>	<b>220.62</b>	<b>127.55</b>	<b>422.56</b>	<b>245.93</b>	<b>235.44</b>	<b>163.35</b>	<b>878.63</b>	<b>536.81</b>

*Source: European Commission DG Energy and Transport, "Research, technological development and studies on road safety 2001-2008: their impact on policy making", 2009*

The total amount invested in the research activity, including private funding, is almost 900 millions of Euro, out of which about 550 millions have been provided by the EC.

The promotion and coordination of the research activity at the European level is indeed a key factor to constantly improve the strategy, the approaches and the actions in the domain of road safety. The role of the research is twofold:

- answering to policy needs: supporting the policy making process by providing useful information in order to build a sound basis to operate effective and efficient choices;
- creating policy inputs: the research may inspire future developments and propose valuable options of interventions; its outcomes may contribute to orient decision makers, by identifying opportunities not taken into account yet.

It is estimated<sup>34</sup> that the average benefit-cost ratio for the money invested in research is equal to 7:1, indicating a strong convenience of these investments. Continuing to support the research activity is,

<sup>34</sup> European Commission DG Energy and Transport, "Research, technological development and studies on road safety 2001-2008: their impact on policy making", 27 May 2009.

indeed, a valuable opportunity to keep the European policy-making process and the automotive sector at the forefront in the field of road safety.

The main specific outcomes of the research projects carried out at EU level and their impacts on the decision making process, planning activity and strategy definition are summarised measure by measure in Annex 1.2.

***Box 11: EU funded research: Stakeholders' main comments***

All the stakeholders agree that the promotion and coordination of the research activity are key areas where the EC should keep providing political and financial support.

## 5 Conclusions

### 5.1 *Major findings of the ex-post evaluation*

In general, the RSAP has had a positive impact on road safety. It is possible to estimate that, since 2001, almost 20,400 lives have been saved, for a total social value of about 31.1 billions Euro.

The stakeholder consultation also supports this positive valuation, with about 46% of the respondents rating the RSAP impact as “high” and about 33% of the respondents rating it as “medium”.

Despite this positive achievement, the overall goal of halving the number of traffic accident related deaths by the year 2010 seems unlikely to be reached: in 2008, the number of European traffic accident related deaths was reduced on average by about 28% only, while a reduction of 42% was required to stay in line with the target. The gap between the actual number of fatalities and the original RSAP objective is estimated as about 7,200 fatalities, which equals to a social loss of about 11 billions Euro.

In this respect, the impact of enlargement should be reminded. When the RSAP was designed, the target set did not include the 12 new Members, which at the time of the accession presented quite a poor performance in terms of road safety. Since 2001, the reduction in road fatalities was only 4% in these countries, while the old Member States, instead, performed much better in achieving the target, reaching a reduction of 37% on average. However, if the CARE estimates for 2009 are confirmed, a converging process emerges in the performance of the new Members already: in 2009: in fact, the NMS12 presents an average reduction in road fatalities since 2001 of 16.8%, compared to the 40.8% reached in the EU15. This could justify the adoption of focused actions for these countries. Moreover, from the significant difference in the performance of new and old Members emerges the added value of the EU initiative.

The delay in meeting the RSAP target is attributable more to delays in the implementation of the foreseen initiatives rather than a low performance in terms of effectiveness, efficiency, and sustainability. In fact, overall, the effectiveness of the measures is positively evaluated, since their implementation has well contributed to the reduction of traffic fatalities. In this regard, it needs to be considered that the majority of the adopted measures are expected to produce their major impacts on road safety in the medium or long term, especially for what concerns thematic studies, research activities and pilot projects. This could explain why the achieved result is presently lower than aimed.

Moreover, the timing of the effects on road safety may as well explain why the overall efficiency for most of the measures is only rated as medium: while the costs are to be sustained in the short run, the benefits are more likely to be produced in the longer term.

The sustainability, instead, is generally highly evaluated, especially regarding the research activity and the coordination and the harmonisation process carried out by the European Commission.

Concerning in particular road safety statistics and monitoring, over the years improvements have been remarkable: today numerous new indicators and observed variables are available for the research, monitoring and evaluation activity. Nevertheless, a lot still needs to be done to complete the road safety database and to integrate and apply the results of the various statistical studies carried out until now.

This has, indeed, a clear impact on the possibility to soundly observe the correct size and nature of a country's road safety situation, especially because a road safety problem (and consequently its socio-economic costs) may be likely bigger that it initially seemed to be.

Disposing of well structured, harmonised, and detailed road safety reporting systems is therefore key for:

- benchmarking road safety with other causes of death and/or loss of quality of life;
- assigning road safety measures the right priority and adequate resources;
- observing whether the trend in the number of fatalities and casualties aligns to the expected results of the road safety measures taken.

Vehicle design improvements (regarding both active and passive safety), enforcement and education and awareness raising initiatives are considered as the most effective measures in creating the conditions for a considerable reduction in deaths and injuries.

## **5.2 What remains to be done**

Carrying out the ex-post evaluation and through the stakeholder consultation, several priority areas have been identified as posing particular concern and deserving special attention in the next ERSAP as well. These are: young drivers, impaired driving, speed, vulnerable road users (pedestrian and cyclists), motorcyclists and rural roads.

Concerning young drivers, despite an important reduction in the risk of young people of being killed on European roads from, on average, 199 fatalities per million inhabitants to about 163 fatalities per million inhabitants since 2001, the fatality risk for this age category remains much higher than the risk for the total European population (86 fatalities per million inhabitants in 2007).

This category of road users, moreover, is the first (but not the sole one) to be largely affected by the issue of impaired driving, i.e. driving under the influence of alcohol or psychoactive substances or with a high level of fatigue. In this respect, many initiatives have been carried out in the field of awareness campaign, education and enforcement, but a lot still need to be done. In particular, the technology of impairment detection devices is not sufficiently mature and would need further developments in view of a potential deployment.

Also speed is still a major issue. Despite the huge progress in the enforcement of speed limits, their violation is still an important factor among the causes of road accidents.

Pedestrian and cyclists deserve special attention as they are the most vulnerable road users and present a relatively higher fatality risks if compared to the general population. Only few actions addressed specifically this categories of road users with rather low results. One measure concerned a very specific study on the effectiveness of crash helmets, which, at present, led to no conclusion and was temporary suspended. Another measure concerned technical requirements for the construction of vehicles in order to reduce the number and the severity of injuries of vulnerable road users hit by them, but, according to EuroNCAP most manufacturers tend to increase adult occupant protection to attract consumers, whilst compromising safety investment in pedestrian protection.

There is still a long way to go in improving the safety of cyclists and pedestrians, and different actions may be taken into consideration, in particular in urban areas, as, for example, researching the effectiveness of bike lanes, improving bikers' visibility, improving pedestrian facilities, sharing best practices across countries, etc.

Motorcyclists are another group presenting a particularly high fatality risk, 18 times higher than for car drivers. Therefore, they deserve that a special focus continues to be dedicated to them, in particular for what concerns novice motorcyclists. In this respect, it will be interesting to see the actual impact of the Directive 2006/126/EC, that will replace Directive 91/439 introducing a staged driving licensing system for motorcyclists on the 19th January 2013.

With regard to rural roads, it is worth noting that more than half of the fatal accidents occurs outside urban areas (54.9%, excluding motorways) and road deaths on rural roads represent the majority of road deaths in all countries with available data. Actions to increase infrastructure safety should be especially aimed to this category of roads.

Beside this prioritisation by field of action, prioritising according to specific geographical needs is fundamental. In this respect, from the analysis it emerges that, in general, the new Member States present a lower performance in road safety and need special support to fill in the gap with the old Members.

In addition to the different domains of intervention mentioned above, there are areas that have not been addressed by the current RSAP. For example, some stakeholders stressed the importance of traffic calming measures and of a more rational use of road transport (car pooling, car sharing and promotion of public transport and of bicycle use) in relation not only to traffic safety, but also to environmental performance.

To face all the different issues and problems, the structure of the new ERSAP could be more flexible, with a more open framework, in order to allow a more integrated vision on road safety and a more differentiated approach according to the specific needs. The current RSAP presents a quite rigid structure, with a list of measures intended to be exhaustive, while a more flexible structure could provide a tool easier to adapt to unforeseen and unexpected problems or very specific issues which may arise in the way.

In this respect, it is relevant to understand if quantified targets should continue to be set or not. According to the stakeholder consultation, setting a quantified target for further reducing road victims is seen as crucial. All the respondents stress the need to include explicit targets into the new programme, since they are considered fundamental for an effective commitment, benchmarking, monitoring and evaluation of the actions aimed at increasing road safety.

Monitoring and statistics are a fundamental activity and need accurate road safety data. As already mentioned, the completion of the set of data and the development of specific indicators need to be finalised. The lack of information, in fact, makes a comprehensive assessment very difficult, if not impossible. The Commission should continue to support and encourage Member States to report more harmonised and detailed road safety statistics, so to facilitate a better degree of analysis and comparison.

In conclusion, a renewed effort is necessary and the new ERSAP should provide stakeholders at a joint European level with a set of measures that can help redouble the effort. These measures should be aimed more specifically at particular member states, categories of road users, or types of roads that perform significantly worse in comparison to the average level of the group concerned in the field of traffic safety.

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CHILD	<a href="http://www.lboro.ac.uk/research/esri/vehicle-road-safety/projects/child%20web%20site/index2.htm">http://www.lboro.ac.uk/research/esri/vehicle-road-safety/projects/child%20web%20site/index2.htm</a>
CLEOPATRA database	<a href="https://www.tispol.org/v/22/">https://www.tispol.org/v/22/</a>
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DG TREN	<a href="http://ec.europa.eu/transport/road_safety/index_en.htm">http://ec.europa.eu/transport/road_safety/index_en.htm</a>
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EEVC	<a href="http://www.eevc.org/">http://www.eevc.org/</a>
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eSafety Support	<a href="http://www.esafetysupport.org">http://www.esafetysupport.org</a>
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International Transport Forum	<a href="http://www.internationaltransportforum.org/irtad/index.html">http://www.internationaltransportforum.org/irtad/index.html</a>
IST Portal	<a href="http://www.ist-world.org">http://www.ist-world.org</a>
MAIDS	<a href="http://www.maids-study.eu/">http://www.maids-study.eu/</a>
NPACS	<a href="http://www.npacs.com/">http://www.npacs.com/</a>
PEPPER	<a href="http://www.pepper-eu.org/">http://www.pepper-eu.org/</a>
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SAVE-U	<a href="http://www.save-u.org">http://www.save-u.org</a>
Smart RRS	<a href="http://smartrrs.unizar.es/home.php">http://smartrrs.unizar.es/home.php</a>
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SpeedAlert	<a href="http://www.speedalert.org/">http://www.speedalert.org/</a>
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TRAIN ALL	<a href="http://www.trainall-eu.org/">http://www.trainall-eu.org/</a>
VC-COMPAT	<a href="http://vc-compat.rtdproject.net/">http://vc-compat.rtdproject.net/</a>
WATCH-OVER	<a href="http://www.watchover-eu.org">http://www.watchover-eu.org</a>

## **Annex 1.1 Stakeholder consultation on RSAP**

The list of stakeholders contacted for the ex-post evaluation of the RSAP, coupled with the road safety measures of their interest, is illustrated in Table 1 below.

**Table 1: List of stakeholders and road safety measures of interest**

Stakeholders	Measures of interest
Confederation of Organisations in Road Transport Enforcement (CORTE)	Users' behaviour (measure nr.: 8) Professional drivers (measures nr.: 48, 49, 50, 51, 52, 53, 54, 56)
ERTICO	Active safety of vehicle (measures nr.: 34, 37, 38, 39) Infrastructure (measure nr.: 46) Accidentology (measure nr.: 58)
eSafety	Active safety of vehicle (measures nr.: 37, 38, 39) Accidentology (measure nr.: 58)
EuroNCAP	Passive vehicle safety (measures nr.: 24, 25, 26, 27, 28)
European Association for Injury Prevention and safety Promotion (EuroSafe)	Generals (measure nr.: 6)
European Association of Automotive Suppliers (CLEPA)	Passive vehicle safety (measures nr.: 22, 23, 25) Active safety of vehicle (measures nr.: 32, 33)
European Automobile Manufacturers Association (ACEA)	Passive vehicle safety (measures nr.: 22, 23, 25, 26, 27, 28) Active safety of vehicle (measures nr.: 29, 30, 31, 32, 33, 36) Professional drivers (measure nr.: 55)
European Enhanced Vehicle Safety Committee	Passive vehicle safety (measures nr.: 24)
European Road Federation (ERF)	Infrastructure (measures nr.: 41, 42, 44, 45, 46)
Project coordinator of the European Road Safety Charter	Generals (measures nr.: 4, 6) Passive vehicle safety (measure nr.: 21) Professional drivers (measure nr.: 51)
European Transport Safety Council (ETSC)	Generals (measures nr.: 2, 6) Users' behaviour (measure nr.: 8) Passive vehicle safety (measures nr.: 26, 28) Active safety of vehicle (measure nr.: 36) Infrastructure (measures nr.: 41, 42) Professional drivers (measures nr.: 55, 56)
European Transport Workers Federation (ETF)	Professional drivers (measures nr.: 48, 49, 50, 51, 52, 53, 54, 55, 56)
Fédération internationale de l'Automobile (FIA)	Generals (measure nr.: 6) Passive vehicle safety (measure nr.: 20) Users' behaviour (measures nr.: 10, 11)
International Co-operation on Theories and Concepts in Traffic Safety (ICTCI)	Passive vehicle safety (measure nr.: 28)
International Road Union (IRU)	Passive vehicle safety (measure nr.: 26) Professional drivers (measures nr.: 48, 49, 50, 51, 52, 53, 54, 55, 56)
Leaseurope	Generals (measures nr.: 6) Users' behavior (measures nr.: 10, 13) Accidentology (measure nr.: 61)
TISPOL	Users' behaviour (measures nr.: 8, 9, 13)

**Table 1: List of stakeholders and road safety measures of interest (continued)**

<b>Stakeholders</b>	<b>Measures of interest</b>
ACEM	Passive vehicle safety (measure nr.: 18) Active safety of vehicle (measure nr.: 35)
FEMA	Passive vehicle safety (measure nr.: 18) Active safety of vehicle (measure nr.: 35)
European Cyclist Federation	Passive vehicle safety (measures nr.: 18, 28)
European Council for Automotive R & D (EUCAR)	Passive vehicle safety (measures nr.: 22, 23, 25) Active safety of vehicle (measures nr.: 32, 33)
European Federation of Road Traffic Victims (FEVR)	Users' behaviour (measures nr.: 10, 11)
International Federation of Pedestrians (IFP)	Passive vehicle safety (measure nr.: 23)
Forum of European National Highway Research Laboratories (FEHRL)	Users' behaviour (measure nr.: 10) Infrastructure (measures nr.: 41, 42, 44, 45, 46)

In the following pages, the models for the questionnaires addressed to European stakeholders and National Authorities are presented. In both cases, the questionnaire have been introduced by an explanatory note of the current RSAP.

## 1 Questionnaire for European stakeholders

### Part I – Questions on the overall RSAP

1. The RSAP identified several areas of intervention for improving road safety across the European MS. Which of them represents the main field(s) of activities for your organization?
2. In your experience, which road safety measures have proved to be most useful in helping to reduce casualties?
  - Engineering/traffic calming measures
  - Education and training initiatives
  - Better pedestrian facilities
  - Local safety schemes
  - Vehicle design improvements
  - Public awareness
  - Vehicle activated warning signs
  - Highlighting hazards
  - Others \_\_\_\_\_
3. In your opinion, should there be more, less or the same amount of safety measures that are currently covered by the RSAP?
  - More
  - Less
  - The same
4. Globally, how would you evaluate the impact on your field of road safety action of the RSAP?
  - Strong
  - Medium
  - Low
  - None
5. How would you evaluate the cost-effectiveness of the financial resources spent for road safety, namely in your field of interest?

## Part II – Questions on specific road safety measures

Please fill in the following table attached to this questionnaire, which aims at evaluating the measures related to your fields of activity on the road safety issue.

In particular, the following question are addressed:

- *state of progress/ implementation*: which is the state of progress of the measure?
- *effectiveness*: how do you evaluate the effects obtained by the measures in road safety-terms?
- *efficiency*: how economically have the various inputs been converted into outputs and results? Were the (expected) effects obtained at a reasonable cost?
- *sustainability*: will the achieved effects last in the medium or long term?
- *effects from non-implementation*: what effects have resulted from the non-implementation of the measure compared with the estimated effects of their implementation?
- *results of the impacts on road safety*: how would you describe the overall impact of the measure?
- *future challenges*: what remains to be done in the ERSAP 2010-2020?

Please feel free to add any further measures or comments you believe appropriate.

## Summary of the measure evaluation

Measure	State of progress/implementation	Effectiveness	Efficiency	Sustainability	Effects of non implementation (if applicable)	Results of the impacts on road safety	Future challenges
<i>Title of the measure</i>	<input type="checkbox"/> Suspended <input type="checkbox"/> Abandoned <input type="checkbox"/> Low advancement <input type="checkbox"/> Medium advancement <input type="checkbox"/> High advancement  <b>Comments:</b> _____ _____ _____	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High  <b>Comments:</b> _____ _____ _____	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High  <b>Comments:</b> _____ _____ _____	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High  <b>Comments:</b> _____ _____ _____	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High  <b>Comments:</b> _____ _____ _____	<input type="checkbox"/> No <input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High  <b>Comments:</b> _____ _____ _____	Shall the measure be: <input type="checkbox"/> Continued <input type="checkbox"/> Redefined <input type="checkbox"/> Discontinued  <b>Comments:</b> _____ _____ _____



## 2 Questionnaire for National Authorities

### Part I – Questions on the overall RSAP

1. The RSAP identified several areas of intervention for improving road safety across the European MS. Which road safety priorities have been identified at national level?
2. In your experience, which road safety measures have proved to be most useful in helping to reduce casualties?
  - Engineering/traffic calming measures
  - Education and training initiatives
  - Better pedestrian facilities
  - Local safety schemes
  - Vehicle design improvements
  - Public awareness
  - Vehicle activated warning signs
  - Highlighting hazards
  - Others \_\_\_\_\_
3. In your opinion, should there be more, less or the same amount of safety measures that are currently covered by the RSAP?
  - More
  - Less
  - The same
4. Globally, how would you evaluate the impact in your country of the RSAP?
  - Strong
  - Medium
  - Low
  - None
5. How would you evaluate the cost-effectiveness of the financial resources spent for road safety in your country?

## **Part II – Questions on specific road safety EU norms (Directives, Regulations and Recommendations)**

Please fill in the following table attached to this questionnaire, which aims at evaluating the transposition of the EU norms on road safety into the national legislation, together with an analysis of their degree of implementation and produced impacts.

Please feel also free to add any further measures or comments you believe appropriate.

## Directives

EC Norm	Area of intervention	Transposed into national legislation?	When was it transposed and by means of which national act?	Level of implementation	Has any impact evaluation been carried out at national level?	Which has been the impact on road safety?	Your comment
<b>Directive XX/Xx</b> Title of the Directive	General/ Users' Behaviour/ Professional Drivers/ Driving license/ Passive Vehicle Safety /Active Vehicle Safety/ Infrastructure /Professional Drivers /Accidentology	<b>YES</b>		<input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low	<input type="checkbox"/> Yes <input type="checkbox"/> No (please explain the reasons)	<input type="checkbox"/> No impact <input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low	
		<b>NO (please explain the reasons)</b> _____ _____					

## Regulations

EC Norm	Area of intervention	Level of implementation / enforcement	Has any impact evaluation been carried out at national level?	Which has been the impact on road safety?	Your comment
<b>Regulation (EC) XX/XXXX</b> Title of the Regulation	General/ Users' Behaviour/ Professional Drivers/ Driving license/ Passive Vehicle Safety /Active Vehicle Safety/ Infrastructure /Professional Drivers /Accidentology	<input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low	<input type="checkbox"/> Yes <input type="checkbox"/> No (please explain the reasons)	<input type="checkbox"/> No impact <input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low	

## Recommendations

EC Norm	Area of intervention	Have these norms been taken into account?	Level of implementation / enforcement	Has any impact evaluation been carried out at national level?	Which has been the impact on road safety?	Your comment
<b>Recommendation XXXX/XXX/EC</b>  Title of the Recommendation	General/ Users' Behaviour/ Professional Drivers/ Driving license/ Passive Vehicle Safety /Active Vehicle Safety/ Infrastructure /Professional Drivers /Accidentolog y	<input type="checkbox"/> Yes  <input type="checkbox"/> No (please explain the reasons)	<input type="checkbox"/> High  <input type="checkbox"/> Medium  <input type="checkbox"/> Low	<input type="checkbox"/> Yes  <input type="checkbox"/> No (please explain the reasons)	<input type="checkbox"/> No impact  <input type="checkbox"/> High  <input type="checkbox"/> Medium  <input type="checkbox"/> Low	

### Part III – Questions on specific RSAP measures

Please answer to the open questions listed in the following table, which aim at collecting data and overall information related to the implementation of some specific measures of the RSAP 2003-2010.

Please feel free to add any further comment and information you believe appropriate.

RSAP Measure	Open questions
<b>Strengthening checks and ensure the proper enforcement of the most important safety rules.</b>	Was a national enforcement plan set up? If yes, when? How many police checks are made on average yearly on speeding, drink driving, seat belts? Which is the infringement rate?
<b>Participating in awareness campaigns about drinking and driving, seat belts, speed and fatigue, if possible combined with national police activities.</b>	How many awareness campaigns have been organised so far? Which is the main target? Are results on their effectiveness available?
<b>Encouraging the application of the recommendation on the blood alcohol limit.</b>	Have these activities been carried out? Which results have been obtained?
<b>Examining the need to include new onboard electronics systems in roadworthiness testing.</b>	Has this activity been implemented? Have any studies been carried out on this issue?
<b>Determining and encouraging best practices so as to improve the efficiency of periodic compulsory inspections at the lowest cost.</b>	Have these best practices been developed and disseminated?
<b>Introducing protection rules for vehicles regularly used for the carriage of children.</b>	Have these rules been introduced? If yes, when and by which national law act?
<b>Assessing and improving systems for linking hospital data and national road accident statistics.</b>	Is there in place a system for linking hospital data and accident statistics?

## Annex 1.2 RSAP measures fact sheets

This Annex provides the factsheets of the individual measures of the RSAP, including a description of the actions, projects, initiatives and research carried out since 2001. The template adopted for the description and evaluation of the measures and the explanation of the terminology are enclosed.

The key outputs of the analysis are summarised in Chapter 3 of the report.

The first measure, which set the general objective of “reducing the number of road deaths by 50% by 2010”, is not included in this annex, but it is approached individually in Section 4.1 of the report in a more exhaustive way because of its peculiar nature.

## Template for measure description and evaluation

### Measure

- *Short description (objective, scope and actors involved)*
- *Classification (EU - National - Local initiative / Thematic study or project / Norm / Technical specification / Statistics / Best practice)*

### State of implementation

- *No (definitive / temporary suspended) / Low / Medium / High advancement / Completed (and description of state of the progress)*

### Impact on road safety

- *Type of impact (direct / indirect)*
- *Timing of the effects (Short, Medium, Long term)*
- *Consistency with other measures*

### Ex-post evaluation

- *Outcomes / Effectiveness / Efficiency (incl. Cost-Benefit) / Sustainability / Effects of implementation or non implementation, as far as possible quantified*

### Results

- *Description of the impact*
- *Contribution to road safety (No / Low / Medium / High results)*
- *What remains to be done (ERSAP 2011-2020)*

### Sources

The ex post evaluation addresses the following question:

- *state of implementation:* which is the state of progress of the measure?
- *effectiveness:* how do you evaluate the effects obtained by the measures in road safety-terms?
- *efficiency:* how economically have the various inputs been converted into outputs and results? Were the (expected) effects obtained at a reasonable cost?
- *sustainability:* will the achieved effects last in the medium or long term?
- *results of the impacts on road safety:* how would you describe the overall impact of the measure?
- *what remains to be done:* which are the future challenges for the ERSAP 2010-2020?



## Index

Index .....	136
<b>GENERALS .....</b>	<b>140</b>
Measure 2 Evaluate the progress made, compared with the target, by means of appropriate performance indicators at Community and national levels .....	142
Measure 3 Provide a report in 2005 on monitoring of the target, action carried out and modifications needed as a result of enlargement and, where appropriate, propose new measures .....	145
Measure 4 Invite all parties concerned to sign a European Road Safety Charter .....	147
Measure 5 Propose the introduction of harmonised road safety criteria in public service contracts .....	149
Measure 6 Study, together with the European haulage industry, additional measures which insurers could take to pass the cost of accident risks on more directly .....	151
Measure 7 Set up a European Road Safety Observatory within the Commission .....	154
<b>USERS' BEHAVIOUR .....</b>	<b>156</b>
Measure 8 Propose measures to strengthen checks and ensure the proper enforcement of the most important safety rules .....	157
Measure 9 Develop best practice guidelines as regards police checks .....	161
Measure 10 Collect, compare and publish information on national highway codes, and on infringements established and penalties imposed in the various countries .....	163
Measure 11 Participate in awareness campaigns about drinking and driving, seat belts, speed and fatigue, if possible combined with national police activities .....	165
Measure 12 Encourage the application of the recommendation on the blood alcohol limit; continue work on the effects of drugs and medicines; establish appropriate classification and labelling of medicines which affect driving ability .....	168
Measure 13 Harmonise, over time, the penalties for the main infringements of the rules of the road for international hauliers .....	173
<b>DRIVING LICENCE .....</b>	<b>175</b>
Measure 14 Amend Directive 91/439/EEC on driving licences in order to introduce in particular minimum standards for car driving examiners and a staged driving licensing system for motorcyclists, trucks- and bus drivers to reduce accident risks among inexperienced drivers .....	176

Measure 15	Continue work on reviewing, in the light of scientific progress, minimum standards for physical and mental fitness to drive and study the impact of medical examinations on road safety.....	179
Measure 16	Work towards establishing a scientific approach to learning how to drive and to road safety training, from school age .....	182
Measure 17	Continue specific work on young drivers and rehabilitation methods to reduce re-offending .....	186
<b>PASSIVE VEHICLE SAFETY .....</b>		<b>189</b>
Measure 18	Encourage the general use of crash helmets by all two-wheel motor vehicle users.....	191
Measure 19	Study the effectiveness of crash helmet use by cyclists in different age groups, as well as the impact on bicycle use and the measures to be taken, where appropriate, at EU level .....	194
Measure 20	The Commission will continue to support EuroNCAP to enable further progress to be made, to raise awareness among and inform consumers and to strengthen the representation of the Member States .....	197
Measure 21	Develop a harmonised specification for the installation of audible or visual seat belt reminder systems and promote their universal use by voluntary agreement .....	200
Measure 22	Introduce universal anchorage systems for child restraint devices.....	204
Measure 23	Improve cars to reduce the severity of accidents involving pedestrians and cyclists.....	206
Measure 24	Study the causes of and ways of preventing whiplash injuries .....	210
Measure 25	Support the development of smart restraint systems .....	214
Measure 26	Adapt to technical progress the front, side and rear-end impact directives for lorries to limit vehicle under-run, and introduce energy absorption criteria .....	216
Measure 27	Make vehicles more compatible .....	219
Measure 28	Examine the impact on road safety of the proliferation of 4x4s, sports utility vehicles and multi-purpose vehicles .....	222
<b>ACTIVE SAFETY OF VEHICLES .....</b>		<b>225</b>
Measure 29	Examine the wide-scale use of daytime running lights on all vehicles .....	227
Measure 30	Improve the visibility of heavy duty vehicles.....	230
Measure 31	Eliminate blind spots towards the rear for drivers of heavy duty vehicles.....	232
Measure 32	Assess measures to reduce tyre-related accidents .....	235
Measure 33	Examine driver impairment detection devices, e.g. alcohol ignition interlocks ('alcolocks') and driver fatigue detectors.....	238
Measure 34	Examine national trials of intelligent speed adaptation devices and assess their acceptability to the public.....	241

Measure 35	Improved motorcycle safety through legislation or voluntary agreements with the industry.....	246
Measure 36	Examine the benefits of harmonising the approval of adaptations to vehicles for persons with reduced mobility.....	249
Measure 37	Adopt a long-term plan concerning information and communication systems in the field of road safety and establish the necessary regulatory framework for implementing such systems.....	251
Measure 38	Identify priority areas for the development and implementation of performance standards to optimise the man-machine interface and the road safety potential of telematics applications. Ensure compliance with the declaration of principles concerning the human-machine interface .....	254
Measure 39	Examine, together with the Member States, the need to include new onboard electronics systems in roadworthiness testing.....	256
Measure 40	Determine and encourage best practices so as to improve the efficiency of periodic compulsory inspections at the lowest cost .....	260
<b>INFRASTRUCTURE .....</b>		<b>264</b>
Measure 41	Submit a proposal for a framework directive on road infrastructure safety with a view to introducing a system for the harmonised management of black spots and road safety audits for roads on the trans-European network.....	265
Measure 42	Draw up technical guidelines concerning infrastructure, notably for low cost measures, audit methods, urban safety management, speed moderation techniques and forgiving roadsides.....	267
Measure 43	Draw up good practice guidelines for level-crossing safety.....	270
Measure 44	Assess the safety impact of projects receiving Community funding and concerning an entire area.....	272
Measure 45	Adapt to technical progress the Community standards applicable to road equipment and ensure a high level of protection, notably by making road sides less hazardous in the event of an accident .....	274
Measure 46	Carry out research and demonstration projects on 'intelligent roads' .....	276
Measure 47	Achieve a high level of safety in tunnels, notably through standards and user information.....	280
<b>PROFESSIONAL DRIVERS.....</b>		<b>282</b>
Measure 48	Adoption and incorporation in national legislation of a European Parliament and Council directive on the training of commercial drivers .....	283
Measure 49	Tighter legislation (and enforcement) of driving and rest periods for commercial road haulage.....	285
Measure 50	Installation of digital tachographs in commercial vehicles .....	287
Measure 51	Best practice guidelines concerning company policies.....	290
Measure 52	Best practice guidelines concerning the securing of loads and the carriage of exceptional loads .....	292
Measure 53	Adapting to technical progress the Community legislation concerning the carriage of hazardous goods .....	295

Measure 54	Making the wearing of seatbelts mandatory in coaches and heavy goods vehicles .....	297
Measure 55	Introducing protection rules for vehicles regularly used for the carriage of children .....	299
Measure 56	Examining the impact on road safety of the growing use of small commercial vehicles and company vehicles.....	303
<b>ACCIDENTOLOGY.....</b>		<b>305</b>
Measure 57	Examine best practice with regard to post-accident medical care .....	306
Measure 58	Draw up specifications for satellite-positioning accident-warning systems and carry out demonstration projects involving the whole chain of emergency service provision .....	308
Measure 59	Develop the CARE database and widen access to it, in the interest of achieving greater transparency and encouraging its use; expand CARE to include hazard exposure variables and the causes of accidents .....	311
Measure 60	Assess and improve systems for linking hospital data and national road accident statistics.....	315
Measure 61	Develop specifications for on-board accident recording devices, and examine the consequences of various alternatives for certain categories of vehicles.....	318
Measure 62	Establish a European methodology for independent road accident investigations and set up a group of independent experts meeting within the Commission .....	321

## **GENERALS**

- Measure 2: Evaluate the progress made, compared with the target, by means of appropriate performance indicators at Community and national levels
- Measure 3: Provide a report in 2005 on monitoring of the target, action carried out and modifications needed as a result of enlargement and, where appropriate, propose new measures
- Measure 4: Invite all parties concerned to sign a European Road Safety Charter
- Measure 5: Propose the introduction of harmonised road safety criteria in public service contracts
- Measure 6: Study, together with the European haulage industry, additional measures which insurers could take to pass the cost of accident risks on more directly
- Measure 7: Set up a European road safety Observatory within the Commission



**Measure 2 Evaluate the progress made, compared with the target, by means of appropriate performance indicators at Community and national levels**

**Objective:** defining and developing a set of performance indicators related to road safety.

**Description**

In order to establish a set of indicators, DG TREN has funded the SafetyNet project.

The activity carried out by SafetyNet are:

- data harmonisation,
- assessment of data availability,
- gathering of pre-existing and new data,
- development of safety performance indicators,
- data analysis.

The project involved 22 institutes from 18 countries. It also provided the basis for the development of the framework for the European Road Safety Observatory (ERSO, see Measure 7).

The SafetyNet project adopted the approach developed within the framework of SUNflower, a research project carried out in three different steps in order to establish a methodology that could be the basis for comparative studies among Member States:

1. SUNflower: a comparative study of the development of road safety in Sweden, the United Kingdom and the Netherlands;
2. SUNflower+6: a comparative study of the development of road safety in nine European countries, that resulted also in a first design of a road safety footprint (defined as a representation of the road safety status of a country, containing a combination of indicators);
3. SUNflowerNext: a study aimed at the development of a knowledge-based framework for comprehensive benchmarking of road safety performances and developments, elaborating the concept of footprint introduced by Sunflower+6.

**Classification:** *statistics.*

**State of implementation**

Duration of the SafetyNet project: from May 2004 to October 2008.

Duration of the SUNflower project: from January 2002 to December 2002.

Duration of the SUNflower+6 project: from January 2004 to December 2005.

Duration of the SUNflowerNext project: from 1 May 2004 to 1 November 2008.

*Medium advancement*

## Impact on road safety

**Type of impact:** *indirect.*

Support tool for analysis and for policy development.

**Timing of the effects:** *long term.*

**Consistency with other measures:** evaluating and assessing the progress achieved is not only consistent, but also necessary for the definition of the policies and actions aimed at increasing road safety.

## Ex-post evaluation

### Outcomes

SafetyNet has developed a range of new data and information protocols and has analysed different statistical approaches and methods. Specific achievements are:

- The CARE database and a range of standard statistical outputs (reports and factsheets);
- New fatal and in-depth accident causation databases;
- Standard protocols for risk exposure data;
- Recommendations for future collection of exposure data;
- Conduction of pilot studies for exposure data gathering in selected countries;
- Reviewing of the state of the art of the definitions for key Safety Performance Indicators (SPI) and definition of new guidelines for methods to gather and record key Safety Performance Indicators.

Concrete outputs:

- 91 deliverables have been produced, some of which were for internal use only or represented intermediate results.
- the ERSO website<sup>1</sup> has been established to provide access to data, knowledge and information. At the end of the project the site was receiving over 7,000 hits each month.
- Elaboration of the SUNflowerNext report (SWOV, 2008), with the definition of a composite road safety performance index (SUNflower index).

**Effectiveness:** *high.*

A large number of standard statistical outputs has been developed.

**Efficiency:** *medium.*

SafetyNet project cost: 19,470,000 euro

SafetyNet project EC funding: 9,999,999 euro

SUNflower project cost: 208,154 euro

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<sup>1</sup> [www.erso.eu](http://www.erso.eu)



SUNflower project EC funding: 104,077 euro

SUNflower+6 project cost: 1,019,331 euro

SUNflower+6 project EC funding: 509,666 euro

There have been difficulties regarding data collection at national level with some Member States (see Measure 59, concerning the CARE database, for more details).

**Sustainability:** *high*.

The project outcome represents an important resource at EU and national level as a fundamental scientific support for efforts towards safer roads in Europe. It is the platform to continue improving the statistics and the research methodologies related to road safety.

The network created between the involved partners will facilitate future cooperation and exchanges of experience.

## Results

**Description of the impact:** the research and the analysis carried out in the framework of the SafetyNet project have been the basis not only for the development of the European Road Safety Observatory, aimed at the gathering of data and knowledge to inform future safety policies and enabling to monitor progress, identify best practices and ensure evaluation, but also for the establishment of a set of European indicators. Without indicators, no policy development, implementation and assessment is possible.

**Contribution to road safety:** *high results*.

**What remains to be done (ERSAP 2011-2020):** the evaluation exercise needs to be continued. Member States should be encouraged to improve their data collection.

## Sources

SafetyNet website

ERSO website

SWOV, SUNflowerNext: Towards a composite road safety performance index, 2008

**Measure 3 Provide a report in 2005 on monitoring of the target, action carried out and modifications needed as a result of enlargement and, where appropriate, propose new measures**

**Objective:** evaluating the progress made in the framework of road safety initiatives.

**Description**

Two EC official documents have been published on the 22<sup>nd</sup> of February 2006:

- a mid-term review, as announced in the RSAP 2001-2010 (Communication COM(2006) 74 final);
- a document supporting the Communication, which includes the statistics, an overview of the legislation, projects and studies implemented and the commitments taken in the framework of the European road safety Charter.

**Classification:** *thematic study/EU initiative.*

**State of implementation**

*Completed*

**Impact on road safety**

**Type of impact:** *indirect.*

**Timing of the effects:** *short and medium term.*

**Consistency with other measures:** the evaluation *in itinere* is a key exercise to assess the approaches adopted within the framework of the different measures of the RSAP and potentially to adjust them in order to better respond to the issues emerging during the implementation.

**Ex-post evaluation**

**Outcomes**

- Communication, European Road Safety Action Programme Mid-term Review, 22 February 2006.
- Staff Working Document for the European Road Safety Action Programme Mid-term Review, SEC(2006)221, 22 February 2006.

**Effectiveness:** *not computable.*

**Efficiency:** *not computable.*

**Sustainability:** *not computable.*

**Results**

**Description of the impact:** support action for policy assessment and development.

**Contribution to road safety:** *medium results.*

**What remains to be done (ERSAP 2011-2020):** the new ERSAP should contain an analogous mid-term evaluation.

#### Sources

European Commission, Communication COM(2006) 74 final, European Road Safety Action Programme Mid-term Review, Brussels, 22 02 2006

European Commission, Staff Working Document SEC(2006)221, European Road Safety Action Programme - Mid-term Review, Brussels, 22 02 2006

## **Measure 4 Invite all parties concerned to sign a European Road Safety Charter**

**Objective:** implementing shared responsibility in the actions for improving road safety.

Since 6 April 2004, enterprises, associations, schools, the media, public authorities and other stakeholders are invited to commit themselves to taking specific, measurable action in their areas of responsibility to contribute to road safety.

The specific objectives of the Charter are:

- Increasing road safety awareness;
- Developing initiatives in the road safety domain beyond the minimum legal requirements;
- Creating a network of stakeholders and facilitating the exchange of best practices.

**Classification:** *EU initiative.*

### **State of implementation**

*Medium advancement*

### **Impact on road safety**

**Type of impact:** *indirect.*

**Timing of the effects:** *short, medium and long term.*

**Consistency with other measures:** the individual Charter commitments have a key role in pursuing several objectives of the current RSAP, in particular for what concerns Measures 6, 17, 18, 21 and 22.

### **Ex-post evaluation**

#### **Outcomes**

To date (September 2009), 1,439 signatories have subscribed to the Charter's commitments, of which 533 associations, 550 enterprises, 330 public authorities and 17 schools and research institutes.

Regarding the type of commitment, 77.5% of the signatories engaged in the thematic area "user behaviour", 13% in "infrastructure safety", 7% in "vehicle safety" and in "professional transport" respectively and 5.5% in "accidentology".

From January 2005 to July 2009:

- 62 public events took places in different EU Member States.
- Three editions of the Excellence in Road Safety Awards have been held, bringing together high-level representatives of the European Commission and representatives involved in road safety actions from all 27 Member States (more than 150 in 2008).
- Three Summer Contest and one Summer Campaign have been organised.

**Effectiveness:** *medium.*

The aim was to have 2,500 signatories by 2008, but to date only 1,439 stakeholders have signed the Charter. Thus only the 57.5% of the expected result has been achieved.

**Efficiency:** *medium.*

It is a rather low cost measure addressing a wide range of issues concerning road safety with on average.

A scientific assessment and quantification of the impacts of the individual commitments is not available.

Overall, the efficiency is evaluated as medium.

**Sustainability:** *medium.*

The framework for encouraging and supporting commitments by the part of the relevant stakeholders is in place, but in order to keep developing initiatives beyond the minimum legal requirements a continuous effort is needed.

The network created between the stakeholders will facilitate future cooperation and exchanges of experience.

## Results

**Description of the impact:** the concrete commitments taken under the Charter contribute to increase road safety.

**Contribution to road safety:** *medium results.*

**What remains to be done (ERSAP 2011-2020):** the Commission should continue to support the European Road Safety Charter to enable future progress to be made, encouraging the self-evaluation of the single commitments undertaken by the part of the private actors according to harmonised criteria. Moreover the signatories of the Charter should be organised in permanent forums as to, e.g., exchange good practices.

## Sources

European Road Safety Charter website

European Commission, European Road Safety Charter, Mid-Term Evaluation, January 2007

## **Measure 5 Propose the introduction of harmonised road safety criteria in public service contracts**

**Objective:** developing common European criteria for road safety in public contracts.

### **Description**

The purpose of this measure is to incorporate road safety requirements and in particular harmonised road safety criteria in the public procurement process. This would apply, for instance, to the purchase of public authorities vehicles or to the provision of transport services. Examples of such scheme would be:

- making mandatory the purchase of EuroNCAP 5-star vehicles;
- purchasing collective transport means (for example school buses) with specific active safety devices (eCall, alcoholocks, etc.).

However, so far this concept has found application with the Annex II of the [Directive 2008/96/EC](#) on Road Infrastructure Safety Management, which defines the criteria to be met by Member States when carrying out a road safety impact assessment (article 3.2) or a road safety audit (article 4.2).

**Classification:** *technical specification.*

### **State of implementation**

This objective has seen only a partial realisation. Action has been taken only for what concerns the infrastructures management.

The Directive 2008/96 comes into effects in December 2010. By 19 December 2011, Member States should adopt the guidelines for applying the safety procedures set out in the Directive.

*Low advancement*

### **Impact on road safety**

**Type of impact:** *indirect.*

**Timing of the effects:** *medium term.*

**Consistency with other measures:** this measure is closely linked with all the actions relating to road infrastructure safety management. In particular, it is linked with the aim of Measure 44 relating to safety impact assessment.

### **Ex-post evaluation**

#### **Outcomes**

The Directive will be applied in the implementation of the projects of the trans-European road network and the projects carried out by the European Investment Bank (EIB) and the European Regional Development Fund (ERDF).

**Effectiveness:** *not computable.*

**Efficiency:** *not computable.*

**Sustainability:** *not computable.*

## Results

**Description of the impact:** the adoption of harmonised road safety criteria in public services contracts contribute to taking into account the impact on road safety in project definition, planning and implementation, allowing an increase in safety awareness and safety performance of the contractors.

**Contribution to road safety:** *medium results.*

**What remains to be done (ERSAP 2011-2020):** an evaluation of the impacts should be carried out once the Directive is regularly implemented. The potential extension to different domains, others that infrastructures management, should be studied.

## Sources

Directive 2008/96/EC of the European Parliament and of the Council on Road Infrastructure Safety Management, 19 November 2008, OJ 319/59 of the 29 11 2008

**Measure 6 Study, together with the European haulage industry, additional measures which insurers could take to pass the cost of accident risks on more directly**

**Objective:** increasing drivers' behaviour.

**Description**

The most important accident cost categories are material damages, administrative costs, medical costs, production losses and the so called risk value, a proxy to estimate the loss caused by traffic accidents in monetary values. They are the sum of the private costs (directly related to the use of the transport mode) and of the external costs (costs to society) of transport.

The risk value dominates in total social and external accident costs and represents the society's willingness to pay for avoiding death casualties or injuries in transport. However, this is not covered properly by the private insurance systems (Delft, 2008).

The main parameters determining accident costs are:

- accident risk (depending on traffic volume, composition of traffic, speed of vehicles, road conditions, weather, time of day, safety regulation and driver's characteristics and behaviour);
- risk elasticity;
- cost already born by the user (especially risk value).

Cost internalisation can impact the values of these parameters. It is a policy instrument that provides economic incentives for transport users to adjust their behaviour, by reflecting the external costs.

When a transport user buys a transport good, he does not fully pay for the associated negative impacts on society, such as the risk of death and injuries imposed on other transport users. If the external costs are linked to the actual risk of accident more directly, a positive effect will be obtained on driver's behaviour, because the user will try to avoid the extra costs reducing his risks.

The degree in which the social costs are internalised depends on the legal system and the insurance system. Internalisation of external costs can be done by using either direct regulation or economic instruments such as taxes, subsidies or quotas. In the case of road safety, km-tax or insurance premiums may be ways of internalising.

If traffic accidents are to be internalised as a km-charge, only a road pricing regime with a high differentiation in time, space and vehicle type will capture some of the large differences in accident profiles. But it would be difficult to include all significant differences, such as age and sex.

Instead, insurance companies are better able to differentiate accident costs according to the accident risk involved with different driving times and routes and to capture the driver's characteristics. They are the experts in how to charge external costs to the users and how to give the best incentives.

In vehicle insurance, an example of premium mechanism is the system "bonus-malus", which takes the risk profile of the driver into account (even though all social costs are not included).



The “bonus-malus” is a very common systems that adjusts the premium paid by a customer according to the individual claim history (the number of requests for reimbursements): the higher is the claim frequency of a policyholder, the higher are the insurance costs that on average are charged.

The charges should be differentiated as much as possible to the external accident costs and based on statistics on fatality and injury risk.

Finally, work related accidents deserves special attention. Companies and organisations seem to focus increasingly on this issue, for example by establishing safety plans. The way they pay their insurance premiums, internalising the external costs, could help to further motivate this kind of initiatives by the part of the industry.

**Classification:** *thematic study.*

### State of implementation

In support of the preparation of the European Road Safety Action Programme 2011-2020, a seminar on the internalisation of social costs was held in Bruxelles on the 7th of September 2009. The title of the workshop was "Road safety economics: internalising external costs; promoting economic incentives, building cases for investment".

*Medium advancement*

### Impact on road safety

**Type of impact:** *indirect.*

**Timing of the effects:** *short term.*

**Consistency with other measures:** this measure is consistent with the objectives of all the measures related to road users' behaviour, since it aims at improving their attitude to road safety.

### Ex-post evaluation

#### Outcomes

There is still no scientific consensus on a best practice approach to pass the cost of accident risks on more directly and it is not clear yet whether insurances can easily switch to a pay-as-you-drive scheme, since there may be legal barriers that prevent them to adopt this solution (COWI, 2009).

In its consultations, the Commission has received support for a repercussion of the social costs on the insurance premiums. However, such action should take into account the differences which exist between Member States and would require a more detailed examination, in particular on the questions of subsidiarity. The Commission has so far found that the process is not sufficiently advanced to propose an initiative at European level. (European Commission Staff Working Paper, 2008).

**Effectiveness:** *medium.*

Some studies show that the internalisation of the environmental and congestion costs contributes to re-orientating traffic towards safer modes and generates, consequently, a reduction in the number of accidents (European Commission Staff Working Paper, 2008).

Moreover, a “bonus-malus” system usually presents a positive effect on road safety, as it stimulates drivers to be careful and avoid accidents that would lead to the loss of bonus.

**Efficiency:** *medium.*

A clear definition of accident costs is needed in order to assess in detail which accident costs are already internalised. Then a thorough cost-effectiveness analysis should be made in order to assess whether an insurance solution is the appropriate and proportionate response.

**Sustainability:** *high.*

Once the institutional framework for passing the cost of accident risks on more directly will be in place, the effects are expected to last in the long run.

## Results

**Description of the impact:** if the external costs are directly linked to the actual risk of accident, a positive effect can be obtained on driver’s behaviour, since the user will have an incentive to reduce risks in order to avoid extra costs.

**Contribution to road safety:** *medium results.*

**What remains to be done (ERSAP 2011-2020):** further studies should be made, together with insurance companies, to understand whether it is worthwhile to switch to pay as-you-drive schemes, providing optimal incentives at the margin, or if the costs of introducing such schemes do not weigh up against averaging. A research on the best practices in the insurance system and their impacts on road safety could be carried out.

## Sources

European Road Safety Charter website

COWI, Technical Assistance in preparation of the new European Road Safety Action Programme 2011-2020, Workshop Background Paper III - Accident reduction and internalising external costs, 4 September 2009

Delft, Handbook on estimation of external costs in the transport sector, February 2008

European Commission, Communication COM(2008) 435 final, Strategy for the internalisation of external costs, 8 July 2008..

European Commission, Commission Staff Working Paper accompanying Communication COM(2008) 435 final, Technical annex to the strategy for the internalisation of external costs, 2008

## **Measure 7 Set up a European Road Safety Observatory within the Commission**

**Objective:** establishing a website for reporting road safety data and knowledge.

### **Description**

The European Road Safety Observatory (ERSO) was set up in the framework of the SafetyNet project (see Measure 2). It aims to support the actions of policy makers, researchers and road safety advisors.

**Classification:** *EU initiative.*

### **State of implementation**

The pilot website was finalised in October 2008 within the framework of SafetyNet.

ERSO has then been transferred to Europa website and is now available in the transport section.

*Completed*

### **Impact on road safety**

**Type of impact:** *indirect.*

Support tool for policy development and evaluation.

**Timing of the effects:** *long term.*

**Consistency with other measures:** the ERSO is functional to the study and the evaluation of the progress made in the domain of road safety at European level, since it provides a practical mean for gathering the relevant information for the accomplishment of the RSAP measures involving thematic studies and researches.

### **Ex-post evaluation**

#### **Outcomes**

The ERSO website continues to be accessible online.

**Effectiveness:** *medium.*

The ERSO website represents a significant resource for research and policy making at EU and national level.

**Efficiency:** *high.*

Once the website is in place, the costs of running and maintaining it are relatively contained.

**Sustainability:** *high.*

The importance of the information is expected to last in the long term.

## Results

**Description of the impact:** being a key tool for evaluation and research, it is a fundamental support for efforts towards safer roads.

**Contribution to road safety:** *medium results.*

**What remains to be done (ERSAP 2011-2020):** further developing of the European Road Safety Observatory.

## Sources

ERSO website

## **USERS' BEHAVIOUR**

- Measure 8: Propose measures to strengthen checks and ensure the proper enforcement of the most important safety rules
- Measure 9: Develop best practice guidelines as regards police checks
- Measure 10: Collect, compare and publish information on national highway codes, and on infringements established and penalties imposed in the various countries
- Measure 11: Participate in awareness campaigns about drinking and driving, seat belts, speed and fatigue, if possible combined with national police activities
- Measure 12: Encourage the application of the recommendation on the blood alcohol limit; continue work on the effects of drugs and medicines; establish appropriate classification and labelling of medicines which affect driving ability
- Measure 13: Harmonise, over time, the penalties for the main infringements of the rules of the road for international hauliers

## **Measure 8 Propose measures to strengthen checks and ensure the proper enforcement of the most important safety rules**

**Objective:** ensuring a consistent enforcement of road traffic offences, both in substance and in procedural matters, and equal treatment between resident and non-resident drivers.

### **Description**

After an extensive study on traffic rules and enforcement practices in the fields of speeding, drink driving and seat belt use in the EU15 Member States carried out through the project IMPACT LEGAL (Information gathering on speeding, drink driving and seat belt use in the member states) and after having analysed the benefits and costs deriving from improvements in the enforcement within the project IMPACT ECONOMIC (Cost-benefit analysis of road safety improvements), the European Commission published the Recommendation 2004/345/EC, which invites Member States:

- to set up a national enforcement plan in road safety;
- to ensure the use of automated speed enforcement equipment, the application of random breath testing for surveillance of drink-driving; and intensive enforcement actions concerning the non-use of seat belts;
- to apply effective, proportionate and dissuasive sanctions and/or a remedial measures to speeding, drink-driving and non-use of seat belts;
- to designate an enforcement coordination point for exchange of best enforcement practices.

In the meantime, it was addressed the issue of cross-border enforcement. Enforcement technologies and procedures vary among Member States and make mutual recognition of enforcement actions and co-operation between Members more difficult. For example, sanctions for traffic offences can be either criminal or administrative depending on Member States. This results also in considerable differences in drivers' perceptions.

The Commission examined the legal basis for cross-border enforcement through the project VERA 2 (Cross-border enforcement of road traffic violations).

The following research, carried out within the project CAPTIVE (Common Application of Traffic Violations Enforcement), identified the steps to implement a European approach to cross-border enforcement. The results of this project provided the basis for drafting the Proposal for Directive COM(2008) 151, adopted on the 19th March 2008. The document sets out proposals aimed at securing a more efficient and more effective enforcement and supervision of traffic offences committed in another Member State.

Considering that non-resident drivers are relatively more involved in offences than resident drivers (for example, non-resident drivers represent around 15% of all speeding offenders, whereas they represent only the 5% of the road traffic), the proposal contains provisions of administrative nature for putting in place an effective system of cross-border enforcement of the main road traffic offences: speeding, drink-driving, non-use of seat belts and failing to stop at a red traffic light.

The Member States will have two years to set up the data exchange system and start operating it. No harmonisation of traffic rules or penalties is included.

At the same time, the project VERA 3, the follow-up of VERA 2, is putting in place a pilot action for the exchange of violation information and notification of non-resident violators in France, The Netherlands, Spain and Austria, allowing delegation of authority to enforce financial penalties and addressing how vehicle owner information can be exchanged.

**Classification:** *EU norm.*

### State of implementation

Duration of project IMPACT ECONOMIC: to 1 June 2003.

Duration of project IMPACT LEGAL: from 25 November 2002 to 31 May 2003.

Duration of project VERA 2: from 1 January 2003 to 31 December 2004.

Duration of project VERA 3: from 1 January 2006 to 31 December 2008.

Duration of project CAPTIVE: from 1 January 2005 to 31 December 2005.

The legislative *iter* of the Proposal for Directive COM(2008) 151 still needs to be finalised.

*Medium advancement*

### Impact on road safety

**Type of impact:** *indirect.*

**Timing of the effects:** *short term.*

**Consistency with other measures:** an effective and efficient enforcement is crucial for the implementation of the legislative framework for road safety and for impact positively on road users' behaviour.

### Ex-post evaluation

#### Outcomes

To address the issue of non-resident violators, the project VERA2 defined the concept of a cross border data exchange network for enforcement, known as eNFORCE, involving agencies and organisations competent in carrying out the responsibilities associated with cross-border enforcement and a data exchange service.

Through VERA3, enforcement agencies in France, The Netherlands, Spain, Austria are developing eNFORCE in a pre-operational environment.

**Effectiveness:** *high.*

Research and best practice experiences show that applying good enforcement practices and setting up converging methods of enforcement of road safety rules could result in a reduction of 5,000 road deaths per year in the EU. In socio-economic terms this represents a benefit of five billion Euro per year<sup>2</sup>.

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<sup>2</sup> European Commission, Staff Working Document SEC(2008) 350.

In addition, the Commission believes that the implementation of the sole Directive COM(2008) 151 could reduce the number of road fatalities by between 200 and 250 a year through mechanisms for effective cross-border enforcement, considering that speeding is the cause of 30 % of road fatalities, drink-driving of the 25%, non-use of seat belts of the 17%, and failing to stop at a red traffic light of the 4%<sup>3</sup>.

**Efficiency:** *medium.*

IMPACT ECONOMIC project cost: 117,750 euro

IMPACT ECONOMIC project EC funding: n.a.

IMPACT LEGAL project cost: 213,800 euro

IMPACT LEGAL project EC funding: n.a.

VERA 2 project cost: 1,157,061 euro

VERA 2 project EC funding: 1,000,000 euro

VERA 3 project cost: 1,000,000 euro

VERA 3 project EC funding: 500,000 euro

CAPTIVE project cost: 449,968 euro

CAPTIVE project EC funding: n.a.

Despite their magnitude, the high costs of enforcement are largely overcome by the benefits on road safety.

**Sustainability:** *low.*

Enforcement needs to be constantly supported by the political commitment and by the action of the police forces. Continued financial support is also a key determinant.

## Results

**Description of the impact:** improving enforcement is expected to have a positive effect on the behaviour of all drivers, therefore increasing road safety.

**Contribution to road safety:** *high results.*

**What remains to be done (ERSAP 2011-2020):** cross-border enforcement needs to be effectively implemented. Checks need to be further strengthened.

## Sources

European Transport Safety Council website

European Commission, Recommendation 2004/345/EC on enforcement in the field of road safety, 6 April 2004

<sup>3</sup> European Commission, Staff Working Document SEC(2008) 350.



Communication from the Commission 2004/C 93/04 concerning Commission Recommendation 2004/345/EC on enforcement in the field of road safety

European Commission, Proposal for a Directive of the European Parliament and of the Council facilitating cross-border enforcement in the field of road safety, COM(2008) 151 final, Brussels, 19 March 2008

European Commission, Staff Working Document SEC(2008) 350 accompanying the Proposal for a Directive of the European Parliament and of the Council facilitating cross-border enforcement in the field of road safety

Opinion of the European Economic and Social Committee on the 'Proposal for a Directive of the European Parliament and of the Council facilitating cross-border enforcement in the field of road safety' (2009/C 77/18), 16 July 2008

SARTRE 3 consortium, European drivers and road risk, June 2004

European Transport Safety Council (ETSC), Traffic Law Enforcement across the EU Time for a Directive, 12 March 2007

## Measure 9 Develop best practice guidelines as regards police checks

**Objective:** evaluating the possible improvements in the framework of the police enforcement of road traffic.

### Description

In year 2006 started the project PEPPER (Police Enforcement Policy and Programmes on European Roads). The objective of the project was to enhance the effectiveness and efficiency of the police enforcement of road traffic. The project looked critically at all relevant aspects of enforcement, such as target behaviours, the detection of infringements, administrative and legal handling after infringement, decisions concerning the volume, location and timing of enforcement, effects of enforcement on road user behaviour and accidents, enforcement methods and tools, collection of enforcement data, and enforcement in the social context. Speeding, drink driving and use of seat belts were especially targeted. In addition the need for improved enforcement data and better understanding of the impacts was recognised, and the potential of innovative technologies in the different links of the enforcement chain was studied.

**Classification:** *thematic project.*

### State of implementation

The project PEPPER was completed in the year 2008.

*Completed*

### Impact on road safety

**Type of impact:** *indirect.*

**Timing of the effects:** *medium term.*

**Consistency with other measures:** the scope of the measure is consistent with the enforcement of road traffic offences (Measure 8) in order to discipline users' behaviour.

### Ex-post evaluation

#### Outcomes

The main outcomes of the project were:

- The assessment of the application of innovative technologies in enforcement process;
- The identification and dissemination of good practices in traffic law enforcement, in particular:
  - In strategic planning and tactical deployment;
  - In the selected key areas: speeding, drink-driving and seat belt wearing;
  - In data, data collection and data use for monitoring and evaluating traffic law enforcement.

**Effectiveness:** *medium.*

Although differences among EU Member States exist regarding how to manage the issue of road safety, the study provides a useful set of guidelines and recommendations.

**Efficiency:** *medium.*

PEPPER project cost: 3,870,000 euro

PEPPER project funding: 2,090,000 euro

Considering the findings of the carried out project, it could be reasonably assumed that the potentially benefits overcome its costs.

**Sustainability:** *high.*

If taken in account by Member States, the effects of the indications provided by the PEPPER project could potentially last in the long term.

## Results

**Description of the impact:** Improvements regarding police enforcements of road traffic are expected to increase road safety affecting positively the drivers' behaviour. However, since the PEPPER project ended in 2008, it's nowadays difficult to evaluate the impact of the measure on road safety. Probably now it is not very strong, but in the following years it could become significant.

**Contribution to road safety:** *medium results.*

**What remains to be done (ERSAP 2011-2020):** encouraging the dissemination of the good practices provided by PEPPER project among Member States.

## Sources

PEPPER website

Police Enforcement Policy and Programmes on European Roads, Deliverable 17, Final report.

**Measure 10 Collect, compare and publish information on national highway codes, and on infringements established and penalties imposed in the various countries**

**Objective:** assist the policy makers and researches and inform the European road users, improving the safety of cross-border drivers.

**Description**

- In the website of the European Road Safety Observatory (ERSO) there is a section which provides a brief overview of the different traffic rules applied in the Member States. For each country, traffic rules are available for speed, alcohol, day time running lights, winter tyres and safety equipments for cars and bicycles. The information was collected informally with the help of the CARE correspondents.

A more extensive document on national traffic rules is available only for France on the same webpage.

- The Road Traffic Rules comparative study (RTR, 2004) provided background information on the legislation and enforcement actions of road traffic rules in the EU15. The aim was contributing to harmonisation, providing information on best results achieved in the field of legislation issuing and enforcement strategies to decision makers, and informing the general public.
- The European Traffic Police organization (TISPOL) has a public database called CLEOPATRA (Collection of Law Enforcement Operations and Police Activities To Reduce Traffic Accidents) that presents detailed information from six of EU member states (Sweden, Finland, Germany, France, Netherlands, United Kingdom) related to traffic safety, road safety programmes and rules as well as data related to alcohol and drugs, speeding and seatbelts. Other member states are invited to provide similar information. Apart from these six States, general information from an EU perspective is included as well.

The information in this database is police-oriented, it does not lend itself to a easy consultation by the part of the general public.

This database is a part of the EC funded road safety project PEPPER (Police Enforcement Policy and Programmes on European Roads, see Measure 9).

**Classification:** *thematic study.*

**State of implementation**

Duration of the RTR comparative study: from December 2002 to December 2003.

*High advancement*

**Impact on road safety**

**Type of impact:** *indirect.*

**Timing of the effects:** *short term.*

**Consistency with other measures:** this measure is consistent with the aim of increasing the awareness on road safety of the European road users.

## Ex-post evaluation

### Outcomes

- ERSO provides an overview of the different traffic rules applied in the Member States (speed, alcohol, day time running lights, winter tyres and safety equipments for cars and cyclists).
- A final report sums up the collected information, conclusions and recommendations of the RTR study (TIS, 2004). The report includes annexes with country reports, topic tables, lists of useful websites, national key informants, assessment of data quality and the RTR database and guidelines.
- The CLEOPATRA database presents detailed information from Sweden, Finland, Germany, France, Netherlands, United Kingdom.

**Effectiveness:** *not computable.*

**Efficiency:** *not computable.*

**Sustainability:** *medium.*

The comparative analysis of the different traffic rules need to be updated regularly to include the latest legislation.

## Results

**Description of the impact:** a comparative analysis of road codes, infringements and penalties of the EU Members are likely to indirectly support the programme objectives of improving road users' behaviour, making vehicles safer and improving road infrastructure by raising awareness of legal requirements across Europe and by providing the background information needed to develop road safety policies and actions.

**Contribution to road safety:** *low results.*

**What remains to be done (ERSAP 2011-2020):** the collected information needs to be regularly updated. The European Commission could investigate establishing a multilingual website on road laws in all Member States, which could be promoted by ferry, tunnel and travel companies, and that car hire companies, insurers, motoring groups and others could refer their customers to (ABI, 2007).

## Sources

CLEOPATRA database

ERSO website

Consultores em Transportes, Inovação e Sistemas – TIS, Comparative study of road traffic rules and corresponding enforcement actions in the member states of the European Union, Final Report, 2004

Association of British Insurers – ABI, European Drivers: crossing borders safely, November 2007

**Measure 11 Participate in awareness campaigns about drinking and driving, seat belts, speed and fatigue, if possible combined with national police activities**

**Objective:** improving road users' behaviour.

**Description**

The European Commission co-financed numerous campaigns on road safety across Member States between 2001 and 2010.

Concerning drinking and driving, several campaigns have been carried out in the framework of the project EURO-BOB (Pan-European Designated Driver<sup>4</sup> Campaign Project):

- EURO-BOB 2001-2002;
- EURO-BOB 2002-2003;
- EURO-BOB 2003-2004;
- EURO-BOB 2004-2005;
- EURO-BOB 2005-2007.

Moreover, also the following campaigns addressed the issue of driving under the effects of alcohol and drugs:

- ENWA 2007-2010 (European night without accidents);
- NESAs 2004-2006 (Nuit européenne sans accidents);
- VCO 2007-2010 (Opération soirées clean).

With regard to seat belts and restraint systems, different campaigns have been carried out in the framework of the project EUCHIREs (European public awareness campaign on the use of seat belts and restraint systems):

- EUCHIREs 2005;
- EUCHIREs 2007.

Finally, the following campaigns concerned general issues about road safety:

- RED-CROSS 2004-2005 (The European Red Cross road safety campaign);
- VAMOS 2006-2009 (Volunteers always).

No specific campaign was addressed at the themes of speed and fatigue, nor at vulnerable road users such as pedestrians and cyclists.

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<sup>4</sup> The person who does not drink when he has to drive and who drives the rest of the party home safely.

In addition to the direct funding of awareness campaigns, the European Commission supported the campaigning activity through the implementation of two projects.

With the project EURO RS WEB, a website centralising data on awareness campaigns on road safety was created. The aim is exchanging information, knowledge and experience on the campaigns carried out in the different Member States.

The research project CAST (Campaigns and Awareness-Raising Strategies in Traffic Safety) aimed to fulfil the need for tools among campaign practitioners. This projects studied the direct impact of mass media campaigns on road safety.

**Classification:** *thematic projects/EU initiatives.*

### State of implementation

The campaigns cover the entire period from 2001 to 2010.

Duration of the EURO RS WEB project: from 22 December 2003 to 21 December 2006.

Duration of the CAST project: from 1 February 2006 to 31 January 2009.

*High advancement*

### Impact on road safety

**Type of impact:** *indirect.*

**Timing of the effects:** *short and medium term.*

**Consistency with other measures:** this measure is consistent with the actions aimed at influencing road users' behaviour. There is a strong link especially with the actions in the field of enforcement (Measure 8), since there is a combined effect in the changing of road users' behaviour.

### Ex-post evaluation

#### Outcomes

12 pan-European campaign have been carried out throughout the whole period considered by the RSAP 2001-2010.

The project EURO RS WEB produced a internet website ([www.roadsafetyweb.net](http://www.roadsafetyweb.net)) dedicated to road safety campaigns, which presents an overview of what is done in the different countries. The consultation and submission of the campaigns is exclusively for members. At present, there are only nine participating organisations from as many countries.

The project CAST produced 15 public deliverables, all available on the website, and several other confidential papers. In addition, a manual was developed for designing, implementing and evaluating awareness campaigns, in order to support national governments and organisations wanting to set up such campaigns. Within the project framework, an evaluation of several campaigns was carried out (CAST, 2009).

**Effectiveness:** *high.*

The impact of awareness campaigns is generally evaluated as highly effective both by literature studies and by the consulted stakeholders. A scientific quantification of the impact is not feasible due to lack of data.

**Efficiency:** *medium.*

Total cost of the awareness campaigns co-funded by the Commission: 28,735,531 euro

Total EC contributions of the awareness campaigns: 13,062,464 euro

EURO RS WEB project cost: 167,577 euro

EURO RS WEB project EC funding: 83,788 euro

CAST project cost: 5,460,000 euro

CAST project EC funding: 3,229,000 euro

It is difficult to evaluate the cost effectiveness of awareness campaigns. On average, the required financial support is high, while it is not always possible to properly assess the efficiency of their impacts.

**Sustainability:** *medium.*

The effects of a particular campaign seems to last only in the short term. But repeated and continued advertising and communication can ensure a remarkable behavioural change (CAST, 2009).

## Results

**Description of the impact:** awareness campaigns reduce the risks linked to drivers' misconduct by informing them about the risks and by encouraging them to adopt a safer behaviour, therefore increasing road safety for all road users.

**Contribution to road safety:** *high results.*

**What remains to be done (ERSAP 2011-2020):** encouraging Member States and other stakeholders (e.g. regional authorities) to continue implementing awareness campaigns, using the manuals provided by the CAST (RTD-FP6) project..

## Sources

EURO RS WEB website

CAST website

CAST, Deliverable 4.2, Results of the evaluation of campaigns and relevant findings to validate the tools in WP2, Final version, 31 July 2009



**Measure 12 Encourage the application of the recommendation on the blood alcohol limit; continue work on the effects of drugs and medicines; establish appropriate classification and labelling of medicines which affect driving ability**

**Objective:** providing scientific support to transport policy-makers by increasing knowledge about the effects of psychoactive substance on road safety.

**Description**

The maximum permitted blood alcohol content for drivers is defined by the Recommendation 2001/116/CE.

In 2006, in order to encourage the application of the mentioned recommendation, the European Commission adopted a Communication (Communication (2006) 625) setting out the EU strategy to support Member States in reducing alcohol related harm. The Communication addresses the adverse health effects of harmful and hazardous alcohol consumption in Europe, which is estimated to cause the deaths of 195,000 people a year in the EU. The priorities identified are: to protect young people and children; reduce injuries and deaths from alcohol-related road accidents; prevent harm among adults and reduce the negative impact on the economy; raise awareness of the impact on health of harmful alcohol consumption; and help gather reliable statistics.

In June 2007, the “Alcohol and Health Forum” has been put in place to support, provide input and monitor the implementation of the strategy outlined in the Communication, focusing on topics such as research, information and data collection, and education.

Concerning drugs and medicines, the importance of promoting and widening research on the influence of psychoactive substances over driving ability, so that prevention and law enforcement measures can be grounded on sound scientific evidence, is stated in the Council Resolution on combating the impact of psychoactive substances use on road accidents of 27 November 2003.

The Commission is considering the advisability of the introduction of appropriate and harmonised pictograms on medical packaging, based on the European classification of drugs, according to their effects on driving ability. To this end, impaired driving has been addressed, with different approaches and specific aims, by several projects.

The project IMMORTAL (Impaired motorists, methods of roadside testing and assessment for licensing) aimed at researching the accident risk associated with different forms of driver impairment, studying the effects of medicines and drugs on driving performance.

The project ROSITA 2 (Evaluation of roadside oral fluid drug tests for the detection of drivers under the influence of drugs), instead, conducted an international study to assess the performance of on-site drug tests to detect illegal drug use among drivers.

The project DRUID (Driving under influence, drugs, alcohol and medicines) aims at analysing the effect of psychoactive substance and at establishing guidelines and measures to combat impaired driving, in order to provide a solid base to generate harmonised regulations for driving under the influence of alcohol, drugs and medicine.

The project is also expected to establish an appropriate classification system of medicines affecting driving ability, creating a framework to position medicines according to a labelling system.

Several large scale studies will be conducted on the road in different member countries, involving police and hospitals: several thousands of drivers will be tested for psychoactive substances. Therefore, it can be looked as well as a large prevention program.

The project involves a total of 37 partners from 20 States (18 EC Members, Norway and Switzerland), bringing together academics, researchers, medical institutions and governmental bodies.

Action for the labelling of medicines is also in progress within the European Medicines Agency (EMA), which is responsible for the evaluation and supervision of medicines for human and veterinary use in Europe.

The importance of providing adequate information on the benefits and risks of medicines was already emphasised in the EMA Road Map (EMA, 2005). To this end, the Agency carried out a survey involving patients' and consumers' organisations, healthcare professionals' organisations and representatives of the Agency itself. The survey addressed the communication on benefits and risks of medicines provided in regulatory information in the light of the need for transparent information, focusing on the summary of product characteristics, labelling, the package leaflet, public assessment report and product safety announcements.

According to the main findings of the survey (EMA, 2009), alongside more comprehensive scientific data, there should be a clear description and a concise easy-to-read summaries of benefits and risks of medicines. It is broadly agreed that complete and transparent information must be ensured about any potential harm which could result from the intake of the medicine, including any negative impact on the patients' quality of life (e.g. interference with daily activities, such as driving).

The EMA believes that improved package design and labelling should be put in place and intends to further explore how best to communicate on safety issues. The final aim would be submitting a proposals for a regulatory project on product characteristics, the labelling and the package leaflet for better communicating benefits and risks of medicines.

**Classification:** *research project.*

### **State of implementation**

Duration of the project IMMORTAL: from 1 January 2002 to 30 June 2005.

Duration of the project ROSITA 2: from 1 December 2002 to 1 January 2005.

Duration of the project DRUID: from October 2006 to September 2010.

Duration of the EMA survey: from March to April 2008.

*Low advancement*

### **Impact on road safety**

#### **Type of impact**

*Direct:* application of blood alcohol limits.

*Indirect:* research on effects of drug and medicines supporting policy-making.

#### **Timing of the effects**

*Short term:* application of blood alcohol limits.

*Long term:* research on effects of drug and medicines supporting policy-making.

**Consistency with other measures:** the results of the research on driver impairment find their application in the enforcement measures (Measure 8) and in the awareness initiatives.

## Ex-post evaluation

### Outcomes

The Communication (2006) 625 has identified areas where the EU can support the actions of Member States to reduce alcohol related harm, such as financing projects through the Public Health and Research Programmes, exchanging good practice on issues such as curbing under-age drinking, exploring cooperation on information campaigns or tackling drink-driving and other Community initiatives. The Communication also maps out actions which Member States are taking, with a view to promoting good practice, proposes an Alcohol and Health Forum of interested parties and sets out areas where industry can make a contribution, notably in the area of responsible advertising and marketing.

The members of the European Alcohol and Health Forum have made a series of commitments aimed at reducing alcohol-related harm. So far, 108 commitments have been taken. The vast majority of commitments relates to information and education programmes (46% of commitments); then there are the actions on responsible commercial communication and sales (22% of commitments).

The project IMMORTAL contributed to increase the knowledge on the methods to assess the effect of certain substances on fitness to drive.

Concerning DRUID, up to date (September 2009), 30 deliverables have been produced, but they are not public yet. They will become accessible as soon as the European Commission releases them for publication.

With regard to the EMEA survey, eleven patients' and consumers' organisations and twelve healthcare professionals' organisations have been consulted. The survey was followed by a workshop, where the participants had the opportunity to share their experiences and make proposals. Apart from the results of the consultation, no concrete outcome has still come out.

Besides the specific outputs of the different initiatives, in general it is worth to mention that the involvement of institutes of the new Member States in planning and research activities is likely to support their integration into the European research network.

### Effectiveness

Application of blood alcohol limits: *high*

The impact of blood alcohol limits is generally evaluated as high due to the important contribution it gives to a reduction in injuries or crashes.

Research on effects of drug and medicines supporting policy-making: *not computable*.

**Efficiency:** *low*.

IMMORTAL project cost: 3,343,697 euro

IMMORTAL project EC funding: 2,512,473 euro

ROSITA 2 project cost: 895,000 euro

ROSITA 2 project EC funding: 400,000 euro

DRUID project cost: 23,810,000 euro

DRUID project EC funding: 18,930,000 euro

Up to now, the research on the effects of drug and medicines did not produce any concrete result. Research in this field has proved to be sensibly costly. However, concrete spillover effects are constrained to the field of the application of blood alcohol limits.

**Sustainability:** *high*.

The results of DRUID are expected to become the basis for future European initiatives related to impaired driving. The research will need to be finalised and then continually updated to follow medical developments.

The extensive geographical coverage of the project and the great number of relevant institutes and organisations involved are fundamental basis for the development of a common approach and a broad consensus and can facilitate a widespread dissemination of the results.

## Results

**Description of the impact:** research on the influence of psychoactive substances over driving ability allows that prevention and law enforcement measures can be grounded on sound scientific evidence.

Since the project still needs to be finalised, and several difficulties have been encountered, at present there is not any quantifiable impact on road safety. In the future, a proper classification of the substances affecting driving ability and an increased knowledge about their effects could support actions to improve road users' safety.

**Contribution to road safety:** *high results*.

**What remains to be done (ERSAP 2011-2020):** disseminating the results of past projects and evaluate the feasibility of a European legislation introducing (i) a maximum blood alcohol content; (ii) harmonised methods for checking illegal drugs; and (iii) an appropriate classification and labelling of medicines which affect driving ability.

## Sources

DRUID website

European Medicine Agency website

European Commission, Recommendation 2001/116/CE on the maximum permitted blood alcohol content for drivers of motorised vehicles, 17 January 2001

European Commission, Communication (2006) 625, An EU strategy to support Member States in reducing alcohol related harm, 24 October 2006

Council Resolution (2004/C 97/01) on combating the impact of psychoactive substances use on road accidents, 27 November 2003

European Commission, Charter establishing the European Alcohol and Health Forum, June 2007

European Alcohol and Health Forum, Summary Report on Commitments made by members of the European Alcohol and Health Forum, 20 April 2009

European Medicine Agency, Information on benefit-risk of medicines: patients', consumers' and healthcare professionals' expectations, London, 23 June 2009

European Medicine Agency, The European Medicines Agency Road Map to 2010: Preparing the Ground for the Future, London, 4 March 2005

## **Measure 13 Harmonise, over time, the penalties for the main infringements of the rules of the road for international hauliers**

**Objective:** increasing road safety by disciplining drivers' behaviour.

### **Description**

In order to facilitate the free movement of goods and services and to ensure a high level of safety for national and international transport operations, it could be desirable to uniform rules for international transport at the European level.

The Council Directive 94/55/EC of 21 November 1994 was realised to lay down uniform safety rules for transporting dangerous goods by road within the European Community. Such Directive was amended first by the Directive 2000/61/EC of the European Parliament and the Council of the European Union of 10 October 2000, and then by the Commission Directives 2003/28/EC of 7 April 2003 and 2006/89/EC of 3 November 2006.

The Regulation (EC) No 561/2006 of the European Parliament and of the Council of 15 March 2006 regarded the harmonisation of certain social legislation relating to road transport, amended Council Regulations (EEC) No 3821/85 and (EC) No 2135/98 and repealed Council Regulation (EEC) No 3820/85.

**Classification:** *EU norms.*

### **State of implementation**

Despite an harmonisation of certain social legislation relating to road transport and the approximation of the laws of the Member States with regard to the transport of dangerous goods, an action on harmonisation of sanctions was not carried out.

*Low advancement*

### **Impact on road safety**

**Type of impact:** *indirect.*

**Timing of the effects:** *medium term.*

**Consistency with other measures:** the measure is consistent with the objective of enforcing safety rules (Measure 8).

### **Ex-post evaluation**

#### **Outcomes**

Regulation (EC) No 561/2006 has been adopted in order to introduce clearer and simpler rules about driving times, break and rest periods for professional drivers operating both national and international transport. Indeed, this Regulation has tried to bring effective solutions to the problems that have been experience in interpreting, applying, enforcing and monitoring the provisions included in the Regulation (EEC) 3820/85.

In addition, the Regulation 561/2006 has provided for the installation of digital tachographs (see Measure 50) at the moment of the replacement of the previous equipments for the vehicles used for the carriage of persons containing more than eight seats apart from the driver's seat and having a maximum weight exceeding 10 tonnes, and also vehicles used for the carriage of goods having a maximum weight exceeding 12 tonnes, registered for the first time from 1 January 1996.

The Council Directive 94/55/EC and its amendments provided for measures to ensure the safe transport of dangerous goods at Community level. The last modifications of the Directive 2006/89/EC had to be adopted by Member States by 1 July 2007.

**Effectiveness:** *not computable.*

**Efficiency:** *not computable.*

**Sustainability:** *high.*

The effects of a process of harmonisation of the sanctions could potentially last in the long term.

## Results

**Description of the impact:** harmonising the penalties for the main infringements across the EU would provide a more certain legislative framework for road users, contributing to improve professional road users' behaviour.

**Contribution to road safety:** *low results.*

**What remains to be done (ERSAP 2011-2020):** establishing a proper regulatory framework for the process of harmonisation of penalties for international hauliers.

## Sources

Council Directive 94/55/EC on the approximation of the laws of the Member States with regard to the transport of dangerous goods by road, 21 November 1994

European Commission, Directive 2006/89/EC adapting for the sixth time to technical progress Council Directive 94/55/EC on the approximation of the laws of the Member States with regard to the transport of dangerous goods by road, 3 November 2006

Regulation (EC) 561/2006 of the European Parliament and the Council of the European Union, 15 March 2006

## **DRIVING LICENCE**

- Measure 14: Amend Directive 91/439/EEC on driving licences in order to introduce in particular minimum standards for car driving examiners and a staged driving licensing system for motorcyclists, trucks- and bus drivers to reduce accident risks among inexperienced drivers
- Measure 15: Continue work on reviewing, in the light of scientific progress, minimum standards for physical and mental fitness to drive and study the impact of medical examinations on road safety
- Measure 16: Work towards establishing a scientific approach to learning how to drive and to road safety training, from school age
- Measure 17: Continue specific work on young drivers and rehabilitation methods to reduce re-offending



**Measure 14 Amend Directive 91/439/EEC on driving licences in order to introduce in particular minimum standards for car driving examiners and a staged driving licensing system for motorcyclists, trucks- and bus drivers to reduce accident risks among inexperienced drivers**

**Objective:** reduce accident risks among inexperienced drivers.

**Description**

The new rules introduced by Directive 2006/126/EC aim at reinforcing safety on European roads, at reducing the possibilities of fraud, and at guaranteeing a true freedom of movement for EU drivers through further harmonisation of licences categories.

Regarding road safety, Directive 2006/126/EC defines the indicative minimum age for each type of vehicle (article 4), a staging system for drivers between vehicles categories and the equivalences that Member States may grant for driving on their territory (article 7).

With regard to mopeds, today no licence is needed in most of the Member States. However, accident figures show a highly increased risk of accident involvement of young road users. The Directive introduces a new harmonised licence category AM and a mandatory theory driving test. The age limit for category AM should be 16 years, but Member States may authorise access from the age of 14 having effect on national territory only.

Light motorcycles are limited today to 125 cc and 11 kW. No power to weight ratio is imposed. This could lead to ever lighter vehicles, thus achieving steadily increasing acceleration and top speed possibilities. The Directive introduces a power/weight ratio not exceeding 0.1 kW/kg. All Member States will have to introduce this category of licences which existed in some Member States only.

The current category A will be split into two distinct categories: A2 (motorcycles of a power not exceeding 35 kW, a power/weight ratio not exceeding 0.2 kW/kg and not derived from a vehicle of more than double its power) and “A” (other motorcycles). For category A, the Directive increases the progressive access from the age of 21, raising from two to three years the experience which the applicant must have acquired on a motorcycle A2. The driver will also have to pass a specific practical test limited to driving in traffic, with a special focus on driving outside urban areas and on high-speed road infrastructure. Instead, for direct access, the minimum age limit is raised from the present 21 years to 24 years.

Concerning trailers with B licence, the Directive introduces a clear weight limit rather than a tractor vehicle/trailer ratio.

The Directive also amends trucks and buses categories to:

- refer to the number of passengers and not the number of seats (to avoid that a vehicle such as a bus with mainly standing passengers may be driven by a category B or D1 licence holder, instead of a category D licence holder);
- bring the technical requirements for smaller trucks and buses in line with that of the market's vehicles.

All Member States will need to introduce the categories C1 and D1 for motor vehicles with a maximum authorised mass not exceeding 6,000 kg and for motor vehicles with a capacity to transport not more

than 16 passengers, allowing for a better distinction between the biggest trucks and buses mostly used for commercial transport (fitted with air break/suspension systems and thus more like smaller lorries) and the smaller ones used for different purposes (generally built on an extended chassis for B vehicles). Categories C1 and D1 are equivalent: they only differ in purposes (transport of goods or transport of passengers) but not in the skills and knowledge needed for driving them.

Finally, the Directive sets out the minimum standards which driving examiners shall meet, (article 10 and annex IV), and the minimum requirements for driving test (annex II). Standards on the training and education of driving examiners currently vary widely throughout the Union. In some Member States examiners have almost no specific education or do not even hold the driving licence for the category they are examining. According to the new legislation, driving examiners should:

- have a valid licence for the category they are examining;
- have obtained an initial qualification;
- be obliged to participate in periodic training;
- follow a progressive access in the testing of different vehicles categories.

**Classification:** *EU norm.*

#### State of implementation

Directive 2006/126/EC, adopted on the 20<sup>th</sup> of December 2006, will replace Directive 91/439 on the 19<sup>th</sup> January 2013.

Member States shall adopt and publish, not later than 19 January 2011, the laws, regulations and administrative provisions necessary to comply with the Directive and shall apply those provisions as from 19 January 2013.

*Completed*

#### Impact on road safety

**Type of impact:** *indirect.*

**Timing of the effects:** *long term.*

**Consistency with other measures:** this measure is consistent with the general scope of increasing the safety of novice drivers.

#### Ex-post evaluation

##### Outcomes

- Reinforcement of the progressive access to different vehicles categories, according to vehicle dimension and driver's age and experience.
- Definition of minimum standards for driving examiners.

**Effectiveness:** *high.*

The concrete impacts of this measure will occur starting from 2013, therefore a precise quantification of the impacts is not applicable.

**Efficiency:** *medium*

The application of Directive 2006/126/EC is likely to increase the costs for becoming a certified driver examiners and to obtain the driving licences for certain categories of vehicles.

**Sustainability:** *high*.

Once the new education and training framework will be in place, its impact is expected to last in the long period in particular by increasing the skills of driver examiners and the teaching quality.

## Results

**Description of the impact:** it can be expected that improving current legislation on inexperienced young drivers, who, according to statistics, face a particularly high risk of accident (especially for novice drivers under 24 years of age), will help reducing their risk exposure.

Since theory and practical tests have been harmonised in detail, the harmonisation of the minimum requirements for examiners would ensure that test results are comparable in the EU. It should also have a positive impact on road safety by maintaining examiners' skills and experience in an ever changing technical environment.

Finally, setting out the minimum standards for European examiners can also aide free movement of services in education and training.

**Contribution to road safety:** *high results*.

**What remains to be done (ERSAP 2011-2020):** a verification of the implementation at national level and its impact should be carried out after 2013.

## Sources

Directive 2006/126/EC of the European Parliament and of the Council on driving licences, 20 December 2006

European Commission, Memo, Driving licences: ensuring security, safety and free movement, 21 October 2003

**Measure 15 Continue work on reviewing, in the light of scientific progress, minimum standards for physical and mental fitness to drive and study the impact of medical examinations on road safety**

**Objective:** improving road safety by assuring minimum physical and mental standards to drive.

**Description**

The driving licences department of the Directorate General for Energy and Transport of the European Commission expressed its intention to advance the revision of Annex III of Directive 91/439/CEE, concerning minimum standards of physical and mental fitness for driving power-driven vehicles. To this end, a number of workgroups were formed.

One of these were the Second European Working Group on Diabetes and Driving which carried out the report "Diabetes and Driving in Europe".

The report "New standards for the visual functions of drivers" comprises the advice of the Eyesight Working Group to the European Driving Licence Committee for a possible revision of the standards on vision for driving. Besides, it should be remembered the project GLARE which regarded the development of an instrument to measure glare sensitivity for driving licence application and the establishment of the relation between glare sensitivity and the degree of visual impairment in driving situation.

The Second European Working Group on Epilepsy and Driving produced the report "Epilepsy and Driving in Europe". The purpose of such a report was to give an overview of the current knowledge of the issue regarding epilepsy and driving and to give regulations for implementation in European law.

On the basis of the recommendations provided by working groups, on 25 August 2009 the Commission of the European Communities emanated the Directive 2009/112/EC, amending Council Directive 91/439/EEC on driving licences, in order to harmonise the minimum requirements for fitness to drive at the community level.

Regarding the impact of medical examinations on road safety, it is noteworthy to mention the project MEDRIL. Its objective was to assess the medical examination for driving licence holders in four EU Member States in order to consider the different models used in Europe.

**Classification:** *thematic studies/EU norm.*

**State of implementation**

The study regarding diabetes and driving has been carried out in 2006, while the ones regarding epilepsy and visual functions in 2005.

Duration of the project GLARE: from 1 January 2003 to 21 December 2004.

Duration of the project MEDRIL: from 1 March 2004 to 1 March 2006.

The Directive 2009/112/EC has been emanated on the 25 August 2009.

*Completed*

## Impact on road safety

**Type of impact:** *indirect.*

**Timing of the effects:** *medium term.*

**Consistency with other measures:** the measure is consistent with the general objective of increasing road safety through a proper revision of the physical and mental requirements for driving and their monitoring over time.

## Ex-post evaluation

### Outcomes

Useful recommendations and indications were provided by the working groups as well as by the described projects. Such recommendations were at the basis of the Directive 2009/112/EC.

**Effectiveness:** *not computable.*

**Efficiency:** *not computable.*

Project GLARE total cost: 1,536,038 euro

Project GLARE EC funding: 766,690 euro

Project MEDRIL total cost: 552,000 euro

Project MEDRIL EC funding: 276,000 euro

**Sustainability:** *high.*

The effects of the implementation of the Directive 2009/112/EC and the results of the studies on the impact on road safety of medical examinations are expected to last in the long term.

## Results

**Description of the impact:** The Directive 2009/112/EC is going to increase road safety by reviewing standards for driving as well as the introduction of proper procedures for medical examinations is expected to have a positive impact. However, since the described directive has only recently emanated and the project MEDRIL was just a first initiative towards the development of best practice guidelines for medical examinations, at present the impact on road safety is to be considered low.

**Contribution to road safety:** *low results.*

**What remains to be done (ERSAP 2011-2020):** monitoring the implementation of the Directive 2009/112/EC at national level and continuing the study of the impact on road safety of medical examinations for driving licence holders.

## Sources

Eyesight Working Group (2005), New standards for the visual functions of drivers, May 2005

Second European Working Group on Epilepsy and Driving (2005), Epilepsy and Driving in Europe, Final report, 3 April 2005

Second European Working Group on Diabetes and Driving (2006), Diabetes and Driving in Europe, July 2006

European Commission, Directive 2009/112/EC amending Council Directive 91/439/EEC on driving licences, 25 August 2009

## **Measure 16 Work towards establishing a scientific approach to learning how to drive and to road safety training, from school age**

**Objective:** increasing the effectiveness of education for children and teenagers and therefore improving the safety of young drivers.

### **Description**

Numerous studies have shown that a good percentage of the accidents may be attributed to insufficient or inappropriate training (TRAIN ALL website).

This issue has been addressed by several projects:

The project ROSE-25 (Inventory and Compiling of an European Good Practice guide on road safety education targeted at young people), tendered by the Commission in September 2003, investigated the situation of road safety education in the EU25. The project involved 21 partners.

The project TRAIN-ALL (Integrated System for driver Training and Assessment using Interactive education tools and New training curricula for ALL modes of road transport) aims to develop a computer-based training system that integrates multimedia s/w, driving simulator, virtual driving simulator and on-board vehicle sensors into a single modular platform. The developed tools are being tested and optimised in 11 pilot projects, aiming at products, guidelines, standards, certification and accreditation at pan-European level.

This task is undertaken by a consortium of 17 Partners from 8 European countries, including 6 major manufacturers.

The project ROSACE (Road Safety in cities: change road safety education in Europe) aims at creating a new educative approach based on the concept of “street safety education”, providing the guidelines and material for specific health-promoting actions in and out of schools.

So far, the educational approach of ROSACE has been applied in six pilot projects launched in the schools of six European cities: Athens, Madrid, Rome, Tarragona, Vilnius and Warsaw.

The main project partners are experts in child participation and road safety education. Local communities as well are invited to produce their own material to make ROSACE a reality in each one of the participating cities.

Finally, the project HERMES (High Impact approach for Enhancing Road safety through More Effective communication Skills for driving instructors) has the objective of creating an easy-to-use training package on teacher-trainee communication in classrooms, in cars and on dedicated tracks. A multi-national team of experienced driving teachers, psychologists, educational and coaching experts has been created for this purpose.

The project focuses on the importance for driver training programs of developing self-evaluation skills, addressing how factors such as journey contexts and motivations can impact on driving. Drawing on existing experience of coaching and other active learning methods in driver training and on expert advice on coaching, HERMES is expected to produce a training package for driving teachers. The complete package will be tested and evaluated in a pilot project.

The project CLOSE TO aims to establish innovative methods for driving school education. In particular, it studies the applications of the “peer education method”, in which “equals relate to equals”, and the ways of integrating it into driving education programmes. The objective is confronting young novice drivers with young drivers who have caused traffic accidents: selected young traffic accident offenders will be trained so as to be able to effectively confront beginning drivers with their personal experience as Ambassadors for Traffic Safety.

The projects involves 17 partners from 12 European countries.

**Classification:** *thematic study.*

### State of implementation

Duration of the project ROSE 25: from 29 December 2003 to 29 March 2005.

Duration of the project TRAIN-ALL: from 1 November 2006 to 31 December 2009.

Duration of the project ROSACE: from 1 April 2007 to 31 March 2009.

Duration of the project HERMES: from 1 March 2007 to 28 February 2010.

Duration of the project CLOSE TO: from January 2008 to December 2010.

*High advancement*

### Impact on road safety

**Type of impact:** *indirect.*

**Timing of the effects:** *medium and long term.*

**Consistency with other measures:** this measure is closely link with the initiative related to drivers' behaviour and driving licence, in particular with those specifically addressed to young drivers.

### Ex-post evaluation

#### Outcomes

ROSE-25 work resulted in:

- the Booklet “Good practice guide on road safety education”;
- 25 country reports;
- Final report of the project.

The data collected include detailed results by topics (27 school curricula, 114 media and 193 other actions).

The core developments of TRAIN-ALL focus on driving simulators, with several prototypes development. New simulation tools are developed for motorcycle riding, passenger car (novices and emergency drivers), truck driving and support co-driving, cooperative group training, remote networking, dynamic scenario management, enhanced reality representation and adaptive training.



So far, the project research produced 6 public deliverables.

On March 2009, a conference was held in Barcelona to present the initial results of ROSACE. A new methodological guide and implementation toolkit were introduced. The aim of these materials (available on the website) is to provide practical support, guidance and inspiration to the teachers, local coordinators and all other participants dealing with road safety education.

The preliminary results demonstrate a high level of activities in schools (discussions, drawings, story-telling, posters, questionnaires, exhibitions and building of models) for increasing children awareness on road safety.

The HERMES project is still ongoing. So far, it has produced one public deliverable.

Also the project CLOSE TO is ongoing. So far, its implementation has produced a total of 46 public deliverables, realised in different languages by the partners from 10 countries.

**Effectiveness:** *high*.

The results of the different projects funded by the EU Commission are likely to have a remarkable impact on the existing educational models, by collecting good practices, providing a helpful knowledge basis and preparing an innovative and sustainable approach to road safety education.

Besides, the projects helped to strengthen European networks in the domain of road safety education, creating synergies in education research and development, an important investment for the benefit of the young generation.

**Efficiency:** *medium*.

ROSE 25 project cost: n.a.

ROSE 25 project EC funding: n.a.

TRAIN-ALL project cost: 3,702,408 euro

TRAIN-ALL project EC funding: 2,300,000 euro

ROSACE project cost: 725,000 euro

ROSACE project EC funding: 362,810 euro

HERMES project cost: 1,000,000 euro

HERMES project EC funding: 500,000 euro

CLOSE TO project cost: 2,000,000 euro

CLOSE TO project EC funding: 1,000,000 euro

The projects outputs are available online for further researches and education developments, but they need to be taken into account by the relevant actors.

**Sustainability:** *high*.

The projects outputs are available online for further researches and education developments. Improvements in driving educations are likely to last and to affect drivers population in the long run.

## Results

### Description of the impact

Raising the overall quality of road safety education and ensuring that the resources invested in road safety education are directed to where they are likely to give the highest social returns largely contribute to increase the road users' safety awareness and to improve their behaviour in traffic, in particular for what concerns younger drivers.

**Contribution to road safety:** *high results.*

**What remains to be done (ERSAP 2011-2020):** research on driving education needs to be continued and the results need to be widely applied.

## Sources

ROSACE website

TRAIN ALL website

CLOSE TO website

ROSE25, Final Report, 29 March 2005

## **Measure 17 Continue specific work on young drivers and rehabilitation methods to reduce re-offending**

**Objective:** improving the safety of young drivers.

### **Description**

Road accidents are the main cause of violent mortality among young people. As already illustrated, young people between 15 and 24 years of age are especially vulnerable and account for about 21% of the total road fatalities in the EU.

In order to reduce the accident risk of young drivers, the Commission acted at different levels.

At the legislative level, the EC issued the Directive 2006/126/EC on driving licences in December 2006, which, among others, defines the indicative minimum age for each type of vehicle and a staging system for drivers between vehicles categories aiming at reinforcing safety on European roads (see Measure 14 for more details).

At the same time, the Commission promoted several initiatives in the domains of training, education and campaigns. It funded the project YOUTH ON THE ROAD, backed three European Youth Conferences for Road Safety and is going to support the creation of the Global Youth NGO for Road Safety.

The project YOUTH ON THE ROAD aimed at promoting the participation of young people (up to the age of 24) in road safety actions by creating a platform to promote different initiatives at the local level in 100 European cities. A youth and road safety network involving cultural, social and educational communities directly related to children and young adults was built and a internet website was created to involve young people's associations, parents' associations, cultural or health prevention associations, at local, regional, national and European level.

The European Youth Conferences for Road Safety were held in Brussels in July 2007, 2008 and 2009.

The first European Road Safety Day was held on 27 April 2007 and presented the theme "Young Drivers". During this event, the European Commission took the commitment to host a follow-up meeting dealing with the topic of young people safety on the roads. More than 400 participants from more than 30 countries attended the Conference to discuss safety issues with regard to young people, focusing on the themes of alcohol and drugs in traffic, and training and education.

With the 2008 Conference, a network was set up to work together in order to reduce the number of young people killed every year on European roads. Also, six youth associations were given the opportunity to sign the European Road Safety Charter.

The third European Youth Conferences for Road Safety, held the 9th and 10th of July 2009, brought together young Europeans from 29 countries, specialists, institutions and public and private organisations.

Three workshops discussed the issues of two-wheels, youth behaviour and sustainable mobility, and prepared several proposals that will be send to institutional representatives. In order to promote these recommendations, a representative from the Conference will participate to the Road Safety Conference on October 2009 in Goteborg, and will present them in front of the EU Transportation Ministers.

The idea of a Global Youth NGO for Road Safety was developed in the framework of the World Youth Assembly for Road Safety. The Assembly put in place the basis for the creation of this NGO, which is to be launched in 2010.

Finally, it is worth remembering the project CLOSE TO (see Measure 16), which involves young drivers who caused an accident in an educational process where young people are confronted with coetaneous. Teaching to others ones own mistakes is likely to help offenders to learn and improve.

**Classification:** *norm and EC initiative.*

### State of implementation

Duration of the project YOUTH ON THE ROAD: from 22 December 2003 to 22 December 2005.

The European Youth Conferences for Road Safety is going to take place every year.

The Global Youth NGO for Road Safety is currently being established and will be launched in January 2010.

*Medium advancement*

### Impact on road safety

**Type of impact:** *indirect.*

**Timing of the effects:** *short term.*

**Consistency with other measures:** the measure is consistent with the actions addressed to young drivers, in particular with measure 14 and 16.

### Ex-post evaluation

#### Outcomes

Three European Youth Conferences for Road Safety have been organised up to now.

**Effectiveness:** *not computable.*

There are no available data to assess the impact of this measure.

**Efficiency:** *not computable.*

YOUTH ON THE ROAD project cost: 523,154 euro

YOUTH ON THE ROAD project EC funding: 250,000 euro

**Sustainability:** *high.*

The European Youth Conferences for Road Safety and the upcoming establishment of the Global Youth NGO for Road Safety are expected to have an impact in the long run.

## Results

**Description of the impact:** the campaign to increase young driver awareness on safety issues supports an improvement of the behaviour of young people on the roads. Moreover, the establishment, with the Directive 2006/126/EC, of an indicative minimum age for different type of vehicle and of a staging system for inexperienced drivers is going to directly affect young people and their capacity to drive.

**Contribution to road safety:** *medium results.*

**What remains to be done (ERSAP 2011-2020):** a specific focus on young drivers needs to be maintained.

## Sources

European Road Safety Charter website

DG Transport website

Directive 2006/126/EC of the European Parliament and of the Council on driving licences, 20 December 2006

## **PASSIVE VEHICLE SAFETY**

Measure 18: Encourage the general use of crash helmets by all two-wheel motor vehicle users

Measure 19: Study the effectiveness of crash helmet use by cyclists in different age groups, as well as the impact on bicycle use and the measures to be taken, where appropriate, at EU level

Measure 20: The Commission will continue to support EuroNCAP to enable further progress to be made, to raise awareness among and inform consumers and to strengthen the representation of the Member States

Measure 21: Develop a harmonised specification for the installation of audible or visual seat belt reminder systems and promote their universal use by voluntary agreement

Measure 22: Introduce universal anchorage systems for child restraint devices

Measure 23: Improve cars to reduce the severity of accidents involving pedestrians and cyclists

Measure 24: Study the causes of and ways of preventing whiplash injuries

Measure 25: Support the development of smart restraint systems

Measure 26: Adapt to technical progress the front, side and rear-end impact directives for lorries to limit vehicle under-run, and introduce energy absorption criteria

Measure 27: Make vehicles more compatible

Measure 28: Examine the impact on road safety of the proliferation of 4x4s, sports utility vehicles and multi-purpose vehicles

## **Measure 18 Encourage the general use of crash helmets by all two-wheel motor vehicle users**

**Objective:** increase the safety of the two-wheels motor vehicle drivers.

### **Description**

The main purpose of helmets is to make riding a motorbike safer by reducing the peak and the duration of acceleration of the head by absorbing the energy of a collision.

A legislation project mandating the use of crash helmets was abandoned. Since specific norms already existed in all Member States, there was no need of intervention at the European level, also according to the subsidiarity principle.

At present, the implementation of this measure is carried out in the framework of the European Road Safety Charter, with the voluntary agreements undertaken by the signatories.

The Motorcycle Industry Association (ACEM) has recently signed a new commitment to the European Road Safety Charter: the “ACEM Promotion and Advertising Guidelines” (ACEM, 2006). The general aim of the commitment is to ensure that all promotion and advertisements show the powered two-wheelers used in a safe and responsible manner, in order to positively influence the attitude of the user. In particular, the manufacturers’ advertisement will feature a logo or message recommending that users wear approved helmets, to encourage a responsible behaviour.

**Classification:** *EU / private initiative.*

### **State of implementation**

The EU legislation project on mandating crash helmets was permanently suspended.

A pilot campaign to encourage the use of crash helmets was launched by ACEM in November 2006.

*Medium advancement*

### **Impact on road safety**

**Type of impact:** *direct.*

**Timing of the effects:** *short term.*

**Consistency with other measures:** the action foreseen by this measure is tightly linked with the actions carried out in the domain of road safety education (Measures 16 and 17). The scope is strongly consistent with Measure 35 (motorcycles’ active safety).

### **Ex-post evaluation**

#### **Outcomes**

The table below shows the helmet wearing rate for PTW drivers and passengers. It also indicates that in three countries there is no mandated technical specification on helmet standards.



**Table A. 1: Helmets wearing rates, 2007**

	Helmet standards mandated	Helmet wearing rate: driver	Helmet wearing rate: passenger
BE	Yes	-	-
BG	Yes	-	-
CZ	Yes	97%	85%
DE	Yes	97%	96%
EE	Yes	-	-
IE	Yes	-	-
EL*	Yes	58%	32%
ES	Yes	98%	92%
FR*	Yes	95%	-
IT	Yes	60%	-
CY	Yes	68%	56%
LV*	No	93%	-
LT	No	-	-
HU e	Yes	95%	-
MT **	No	-	-
NL	Yes	92%	72%
AT	Yes	95%	-
PL	Yes	-	-
PT	Yes	-	-
RO e	Yes	90%	65%
SI	Yes	-	-
SK	Yes	-	-
FI e	Yes	95%	-
SE e	Yes	95%	-
UK* e	Yes	98%	-

\* 2006 data.

e: estimate

\*\* Mopeds only.

Source: WHO, 2009

The helmet wearing rate for drivers is in most countries well above 90%. Only Greece, Italy and Cyprus, among the countries with available data, present wearing rate for drivers far from the average. More disappointing is the wearing rate for PTW passengers.

**Effectiveness:** *high*.

A review of the available studies on helmets concludes that helmets are effective at preventing or reducing the severity of head injury to motorcyclists who crash by between 69% (MAIDS, 2009) and 72% (TRL, 2007).

Moreover, according to a study carried out in Greece (Petridou, Skalkidou, Ioannou, Trichopoulos, 1998), the fatality rate of riders with helmet is 44% lower than for riders without a helmet.

**Efficiency:** *high*.

The costs for implementing such measure is limited in comparison with the potential benefits.

**Sustainability:** *medium.*

Efforts in this domain need to be reiterated to achieve long lasting results.

## Results

**Description of the impact:** the use of crash helmets improves injury protection when accidents do occur.

**Contribution to road safety:** *high results.*

**What remains to be done (ERSAP 2011-2020):** support for the general use of crash helmets needs to be continued in the framework of the European Road Safety Charter and through ad hoc campaigns. The initiatives should target in particular those regions presenting the lowest wearing rates and should take into account the characteristics of the targeted population.

## Sources

ERSO website

European Road Safety Observatory, Powered Two Wheelers (revised), 1 August 2008

Mellor, A.N. StClair, V.J.M. & Chinn, B.P., Motorcyclists' helmets and visors : test methods and new technologies. Crowthorne, Berkshire, Transport Research Laboratory (TRL), 2007

Petridou, E. Skalkidou, A. Ioannou, N. & Trichopoulos, D., Fatalities from non-use of seat belts and helmets in Greece: a nationwide appraisal. *accident analysis & prevention*, PP87-91, 1998

ACEM, Commitment signing event, 29 November 2006

**Measure 19 Study the effectiveness of crash helmet use by cyclists in different age groups, as well as the impact on bicycle use and the measures to be taken, where appropriate, at EU level**

**Objective:** improving cyclist safety.

**Description**

From a number of studies, it emerges a contradictory evidence about the effectiveness of cycle helmets.

Most of the evidence in favour of helmet effectiveness has come from “case control studies”, where a group of cyclists with head injuries is compared with one or more groups without. This approach is, however, less reliable than randomized controlled studies or cohort studies, but the latter have not been used in helmet research for practical reasons, since injuries to cyclists are rare, overall.

Sometimes helmets have been found to protect from injuries to the face, sometimes to offer no protection against facial injuries.

Some studies found that casualty trends from countries where helmet use has become significant show no reductions in serious or fatal injuries attributable to helmets. In England, an analysis of road traffic injuries found no association between differing patterns of helmet wearing rates and casualty rates for adults or children (Hewson, 2005).

A study based in the Lothians in Scotland (Scottish Executive Social Research, 2005) found that although 39% of injured cyclists wore helmets, a much lower proportion (18% in 2001) of Scottish cyclists said they always wore a helmet, suggesting that helmet wearing is associated with a higher risk of injury.

A prominent helmet test expert (Walker, 2005) has stated that most helmets are physically incapable of sustaining impacts of the type associated with serious crashes; helmets provide protection only in low impact crashes under favourable circumstances.

Helmeted cyclists have been shown to be more likely to hit their heads if they crash and may be more likely to crash in the first place. Thus, helmet use might adversely affect crash involvement or outcome. Risk compensation by cyclists who wear helmets has been confirmed in research (TRL, 1996).

In conclusion, cycle helmets are likely to prevent minor wounds to the head, but not serious, life-threatening injuries.

Moreover, helmet promotion has also been shown to decrease cycle use (TRL, 1997): in all countries where helmet laws have been introduced and enforced, there has been a substantial reduction in cycling.

Instead, it seems that the greatest influence on cycling safety is the number of people who cycle (Jacobsen, 2003; Robinson, 2005; Turner, Roozenburg, Francis, 2006): cycling gets safer the more people who do it. Conversely, any reduction in cycle use, due to helmets or any other factor, results in reduced safety for cyclists as a whole, including those who decide to wear helmets.

Considering the numerous studies for and against helmets, it seems that the evidence is too ambiguous to take a stand one way or another. It also needs to be considered that, where helmet use is voluntary, the levels of helmet wearing by cyclists are much higher (TRL, 2005).

**Classification:** *thematic study.*

## State of implementation

*Temporary suspended*

## Impact on road safety

**Type of impact:** *indirect.*

**Timing of the effects:** *long term.*

**Consistency with other measures:** in order to finalise this measure, statistics on cyclists accidents need to be improved (in the framework of Measure 59).

## Ex-post evaluation

### Outcomes

The research has still not produced a satisfying outcome and no consensus was reached.

**Effectiveness:** *not computable.*

**Efficiency:** *not computable.*

**Sustainability:** *not computable.*

## Results

**Description of the impact:** the research carried out until now produced contrastive results. At present is not possible to assess the impact of crash helmet use on road safety.

**Contribution to road safety:** *no results.*

**What remains to be done (ERSAP 2011-2020):** a comprehensive review of the evidence needs to be undertaken on a wider base, improving data collection about cyclists road accidents. The research should be extended to assess other measures to improve cyclist safety (for example, construction of bike lanes, improving bikers' visibility, etc.). Cyclist associations need to be involved in the policy processes regarding cycling policies and infrastructure management.

## Sources

Bicycle Helmet Research Foundation website

Hewson PJ, Cycle helmets and road casualties in the UK, Traffic Injury Prevention, 2005

Scottish Executive Social Research, Extent and severity of cycle accident casualties, 2005

Walker B., Heads up. Cycle, June/July 2005

TRL, Attitudes to cycle helmets - a qualitative study, Report 154, 1996

TRL, Cycle helmet wearing, Report 286. 1997

TRL, Cycle helmet wearing in 2004, TRL644, 2005.

Jacobsen PL., Safety in numbers: more walkers and bicyclists, safer walking and bicycling, Injury Prevention, 2003

Robinson DL., Safety in numbers in Australia: more walkers and bicyclists, safer walking and bicycling, Health Promotion Journal of Australia, 2005

Turner SA, Roozenburg AP, Francis T., Predicting accident rates for cyclists and pedestrians, Land Transport New Zealand, Research Report 289, 2006

European Road Safety Observatory, Pedestrians & Cyclists (revised), 16 January 2008

**Measure 20 The Commission will continue to support EuroNCAP to enable further progress to be made, to raise awareness among and inform consumers and to strengthen the representation of the Member States**

**Objective:** encourage and improve the safety of cars.

**Description**

The European New Car Assessment Programme (EuroNCAP) is an international association which tests vehicles in order to provide with an accurate and independent assessment of the safety performance of some of the most popular cars sold in Europe.

The main objectives are:

- encouraging significant safety improvements to new car design;
- reactively and proactively encourage the development of new technologies;
- support the safety departments within car manufacturers;
- reducing the number of crash fatalities and accidents on European roads;
- carrying out independent and accurate crash-testing;
- stimulating discussion on safety issues.

Since 2009, EuroNCAP releases an overall rating for each tested vehicle, with assessments in adult occupant protection, child protection, pedestrian protection and safety assist. It also releases information on electronic stability control fitment and results of seats put through rear impact (whiplash) testing.

The programme involves legislators, industry, research, consumer organisations and insurers.

The European Commission is an observing member of EuroNCAP's board and provides political support.

Moreover, the DG Research funded several scientific projects for enhancing vehicle testing methods and improving their reliability: the projects ADVANCE, CHILD, HUMOS2, SIBER, ISI-PADAS, THOMO and THORAX.

**Classification:** *thematic project.*

**State of implementation**

Established in December 1996, the programme is now backed by seven European Governments (France, Germany, Sweden, United Kingdom, Luxembourg, The Netherlands and the Catalonian part of Spain), the European Commission and motoring and consumer organisations.

In February 2009 a new rating scheme was launched. The new overall rating reflects the protection offered to adult and child occupants as well as pedestrians and, for the first time, considers the safety potential of advanced driver assistance technologies such as electronic stability control.

Up to September 2009, 245 car models have been tested.

*High advancement*

### Impact on road safety

**Type of impact:** *indirect.*

**Timing of the effects:** *medium term.*

**Consistency with other measures:** the activity of EuroNCAP is consistent with all the measure aiming at increasing the vehicle passive safety.

### Ex-post evaluation

#### Outcomes

The results of the tests reveal good car safety performances for what concerns occupant and child protection. On the contrary, most manufacturers still have a long way to go in improving pedestrian protection and seat design (to prevent whiplash injury). It seems that many manufacturers set out to achieve high scores for adult occupant protection to attract consumers, whilst compromising safety investment in other areas.

**Effectiveness:** *high.*

Legislation sets a minimum compulsory standard. Instead, EuroNCAP is concerned with best possible current practice. Legislation can be slow, and provides no further incentive to improve, whereas EuroNCAP provides a continuing incentive by regularly enhancing its assessment procedures to stimulate further improvements in vehicle safety.

Real world injury studies carried out by the Swedish National Roads Administration (SNRA, 2000) and the Safety Advisory Rating Committee (SARAC, 2001) found a positive correlation between average crashworthiness and injury severity and the EuroNCAP rating system with statistical significance, demonstrating a reduction in injury risk for every Euro NCAP star received.

In 2000, the SNRA reported at the IRCOBI conference that “cars with three or four stars are approximately 30% safer, compared to two star cars or cars without an Euro NCAP score, in car to car collisions.” Moreover, the predicted relative risk of severe or fatal injury was reduced by 12%, for each increase in Euro NCAP star rating.

Also the study carried out in the framework of the project SARAC II (see Measure 59) showed that the design priorities encourage by Euro NCAP are consistent with a reduced risk of serious injury in real world crashes (SARAC II, 2006).

**Efficiency:** *high.*

The benchmarking nature of EuroNCAP has proved to be very efficient in increasing vehicle safety: it enabled concrete advancement without passing through the more costly and lengthy legislative process.

**Sustainability:** *high.*

The programme seems to be viable in the long run. Each member pays an annual subscription and must fund the testing of at least one car model each year. Car manufacturers can fund the testing of

their own cars but they cannot influence the testing, assessment or publication of the results. The wide consortium of members ensures independence of the automotive industry and of political control.

## Results

**Description of the impact:** by encouraging safety improvements to new cars design and by informing consumers, EuroNCAP helps to improve vehicles' safety performance on the European roads.

**Contribution to road safety:** *high results.*

**What remains to be done (ERSAP 2011-2020):** EuroNCAP - now a sustainable activity - is no longer supported by the Commission. Beyond the standard information on passive safety, the Euro-NCAP scheme should be encouraged to address more and more additional features.

## Sources

EuroNCAP website

Safety Advisory Rating Committee (SARAC), Safety rating based on real-world crashes for supplementation of new car assessment programs, October 2001

EuroNCAP, A market for safety – Ten years of EuroNCAP, 2005

SARAC II, Alternative weighting on NCAP series to improve the relationship to real world crashes, March 2006



**Measure 21 Develop a harmonised specification for the installation of audible or visual seat belt reminder systems and promote their universal use by voluntary agreement**

**Objective:** increase the safety of car occupants.

**Description**

UNECE made a first step in regulating and harmonising the specifications regarding seat belt reminders (UNECE, 2009), but only for what concerns the driver's position.

Within the EU, the installation of safety belt reminder systems is being implemented and encouraged by voluntary agreements, notably through the project CARS 21, the commitments taken in the framework of the European Road Safety Charter and the incentive given by the EuroNCAP's assessment of cars safety performance.

The research project CARS 21 (A Competitive Automotive Regulatory System for the 21st century) aimed at making recommendations for the short, medium, and long term public policy and regulatory framework for the European automotive industry to enhance global competitiveness and employment while sustaining safety and environmental performance. One of the key aims of the project was to provide regulatory stability and planning certainty for the industry. It examined the major policy areas which impact the competitiveness of the European automotive industry, assessing the possible contribution of the European vehicle industry to the road safety objectives.

The Final Report of the project (CARS 21, 2005) affirms that the best means of improving road safety would be to adopt a holistic, integrated approach involving vehicle technology, infrastructure and the driver. Concerning seat belt reminders, it encourages the adoption of this vehicle technology measure in all new vehicles.

**Classification:** *technical specification.*

**State of implementation**

Duration of the project CARS 21: from 13 January to 12 December 2005.

In June 2008, the EU Commission launched the CARS 21 mid-term review process (CARS21, 2008) to evaluate the progress made, assess the state of play, and consider whether any changes are necessary to the existing regulatory framework in the light of the experience.

In May 2009, the UNECE Regulation 16 adopted uniform technical prescriptions for wheeled vehicles, providing uniform provisions concerning the approval of seat belt reminders.

*Medium advancement*

**Impact on road safety**

**Type of impact:** *direct.*

**Timing of the effects:** *medium term.*

**Consistency with other measures:** the scope of this measure is consistent with the actions carried out in the framework of Euro NCAP (Measure 20) and of the European Safety Charter (Measure 4).

## Ex-post evaluation

### Outcomes

CARS 21 produced a Final Report (CARS 21, 2005) with 18 recommendations aimed at increasing the worldwide competitiveness of the EU automotive industry and at the same time improving road safety. The Report encouraged the adoption of seat belt reminders.

After three years, a mid-term review process of the project was produced involving all the relevant stakeholders.

### Effectiveness: *high*.

The benefit of seat belt reminder systems in reducing the number of road fatalities has been proven in a large number of studies.

A recently published paper (Lie, Kullgren et al., 2007) investigated the influence of advanced seat belts reminders (SBR) on seat belt wearing rates in seven EU countries. The total seat belt wearing rate was 97.5% in cars with SBR, while it was 85.8% in cars without. The study also found that the number of unbelted car occupants is decreased by 80%, independent of the general average wearing rate. The result of this study supports previous estimations that more than 7,000 lives could be saved every year in the EU if all cars were fitted with SBRs (CARS 21, 2005).

The following table illustrates the seat belt wearing rate for 22 EU members. More than two third of the counties presents wearing rates for the front passengers above 80%. But there is still space for improvements, especially for what concerns the wearing rate of the rear passenger, that, in comparison, are quite low.

*Table A. 2: Seat belt wearing rate, 2007<sup>5</sup>*

Country	Seat-belt wearing rate: front	Seat-belt wearing rate: rear
FR *	98%	83%
DE	96%	88%
MT *	96%	21%
SE *	96%	90%
NL *	94%	73%
UK * e	91%	87%
CZ	90%	80%
EE	90%	68%
ES	89%	69%
AT	89%	49%
FI e	89%	80%
IE *	86%	63%
PT **	86%	28%
SI	85%	50%

<sup>5</sup> Data from BG, DK, LT, LU, SK are not available.

CY	81%	9%
RO	80%	20%
BE	79%	46%
LV *	77%	32%
EL *	75%	42%
PL *	74%	45%
HU	71%	40%
IT	65%	10%

\* 2006 data; \*\* 2004 data; e: estimate

Source: WHO, 2009

**Efficiency:** *high*.

CARS 21 project costs: n.a.

CARS 21 project EC funding: n.a.

According to the study carried out by the European Transport Safety Council (ETSC, 2003), seat belt reminder systems for the front seats have shown a very positive cost benefit ratio of 1:6. The benefits of audible seat belt reminders for front seats thus clearly exceed the costs.

**Sustainability:** *high*.

Once seat belt reminder systems will be widely adopted, the effects are likely to last in the long term.

## Results

**Description of the impact:** by increasing the wearing rate of seat belts, seat belt reminder systems increase the safety of car occupants.

**Contribution to road safety:** *high results*.

**What remains to be done (ERSAP 2011-2020):** UNECE recently made a first step in defining the approval of a seat belt reminder system, but only for the driver. From a European perspective, a higher level standard could be justified. The seat belt reminder provisions of this regulation could be used as a basis for a European regulation that includes the front passenger seat and, in a second phase, the rear seating positions.

## Sources

Lie, Kullgren et al., Intelligent seatbelt reminders: Do they change driver seat belt use in Europe, ESV conference paper 07-0388, 2007

European Transport Safety Council (ETSC), Cost effective EU transport safety measures, 2003

UNECE, Regulation 16, Revision 6, Agreement concerning the adoption of uniform technical prescriptions for wheeled vehicles, equipment and parts which can be fitted and/or be used on wheeled vehicles and the conditions for reciprocal recognition of approvals granted on the basis of these prescriptions, Uniform provisions concerning the approval of: (I) Safety belts, restraint systems, child restraint systems and isofix child restraint systems for occupants of power-driven vehicles; (II) vehicles equipped with safety belts, safety belts reminder, restraint systems, child restraint systems and isofix child restraint systems, 19 May 2009

European Commission, DG Enterprise and Industry, CARS 21 Mid-Term Review High Level Conference, Conclusions and Report, 29 October 2008

European Commission, DG Enterprise and Industry, Staff working document accompanying the Communication from the Commission to the European Parliament and the Council, COM(2007) 22 final, Impact Assessment Report, A Competitive Automotive Regulatory Framework for the 21st Century - Commission's response to the CARS 21 High Level Group Final Report, 22 March 2007

European Commission, DG Enterprise and Industry, CARS 21 final report, 12 December 2005

## **Measure 22 Introduce universal anchorage systems for child restraint devices**

**Objective:** increase the safety of children in the car.

### **Description**

The legislative framework for a definition of the anchorage systems for adult passengers is set by the following three Directives:

- Directive 2005/39/EC relates to motor vehicles with regard to the seats, their anchorages and head restraints. It bans the use of side-facing seats in passenger vehicles.
- Directive 2005/40/EC relates to seat belts and restraint systems.
- Directives 2005/41/EC relates to anchorages for safety belts.

However, there is no legislation relating specifically to universal anchorage systems for child restraint devices.

Many child restraint users fail to attach the child restraint securely to the car and this compromises the protection afforded to the children. This is why there is the need for a definition of universal systems for the anchorage of children.

The Euro NCAP has encouraged improved designs and the fitment of ISOFIX mounts and child restraints, which provide a much more secure method of attaching the child restraint to the car, since additional provision is made to prevent rotation of the child restraint. As a consequence, Euro NCAP has seen improved designs, where the child is less likely to strike the car's interior, whilst at the same time experiencing reduced forces from the restraint system.

The improvement of child restraint devices is also supported by voluntary agreements promoted through the European Road Safety Charter.

The general installation of universal anchorage systems for child restraint devices is to be made compulsory by a Directive, but at present there is not any proposal in this respect.

**Classification:** *technical specification.*

### **State of implementation**

*Low advancement*

### **Impact on road safety**

**Type of impact:** *direct.*

**Timing of the effects:** *medium term.*

**Consistency with other measures:** the scope of this measure is tightly linked with the implementation of Measure 55.

## Ex-post evaluation

### Outcomes

In November 2003, Euro NCAP introduced a child occupant protection rating.

**Effectiveness:** *high*.

Approximately, 1,100 children are killed and 80,000 are injured annually on the European Roads. Child restraint devices aim at keeping a child firmly secured in their seat so that the child is not thrown against the car interior or ejected from the vehicle in the case of either a crash or a sudden braking. Such devices enable to reduce by about 25% the risk for children of being injured when sit in the front, and by about 15% when children are sit in the rear (Elvik, 2004).

**Efficiency:** *high*.

The implementation of the child restraint devices is assumed to be cost effective in the long run, despite the initial costs.

**Sustainability:** *high*.

The adoption of such measure may made possible more effective child restraint installation and will thereby increase child restraint effectiveness and child safety in the long term.

### Results

**Description of the impact:** effective anchorage systems for child restraint devices increase the safety of the youngest car occupants.

**Contribution to road safety:** *medium results*.

**What remains to be done (ERSAP 2011-2020):** a legislative proposal making compulsory the general installation of universal anchorage systems for child restraint devices should be studied.

### Sources

EuroNCAP website

European Road Safety Charter Website

Directive 2005/39/EC amending Council Directives 74/408/EEC on seats, their anchorages and head restraints, 7 September 2005

Directive 2005/40/EC amending Council Directives 77/541/EEC on safety belts and restraint systems, 7 September 2005

Directives 2005/41/EC amending Council Directives 76/115/CEE on anchorages for safety belts, 7 September 2005

## **Measure 23 Improve cars to reduce the severity of accidents involving pedestrians and cyclists**

**Objective:** increase the safety of pedestrians and cyclists.

### **Description**

The [EC Directive 2003/102/EC](#) introduced pedestrian protection requirements for the construction of motor vehicles, in order to reduce the number and severity of injuries to pedestrians and other vulnerable road users.

It set the procedure for type-approval of vehicles in two stages, with the injury limits for stage 2 more stringent than those of stage 1. Since many vehicle manufacturers were of the opinion that compliance with the stage 2 limits was not feasible, a review clause was concluded in 2007, proposing a number of relaxations to the stage 2 limits. To offset these relaxations and to ensure that the reductions in pedestrian fatalities and injuries were still achieved, the European Commission proposed mandating the fitment of Brake Assist systems (systems designed to sense an emergency braking situation and assist the driver in achieving the maximum achievable deceleration in the prevailing conditions), which have been shown to have significant benefits in terms of pedestrian protection.

The EC [Directive 2005/66/EC](#) laid down technical requirements for the type-approval of motor vehicles as regards frontal protection systems.

The Directives 2003/102/EEC on pedestrian protection and 2005/66/EC on frontal protection systems were replaced by the new [EC Regulation 78/2009](#) on pedestrian protection, adopted on the 14th January 2009. In the new Regulation:

- The scope is extended to cover vehicles exceeding 2.500 kg.
- Requirements for the mandatory fitment of brake assist systems are introduced.
- The limits for stage 2 tests are reduced.

Uniform technical requirements for wheeled vehicles are also prescribed, for certain vehicle categories, by the [UNECE Regulation 13](#), which, among others, defines the key concepts relating to the braking systems. At present, it is being revised to include a norm about assisted emergency braking systems.

Besides the legislative actions, two research projects have been funded by the Commission in this domain within the framework of the IST programme:

- The [project SAVE-U](#) (Sensors and system architecture for vulnerable road users protection), which developed an innovative sensor platform for an optimised vulnerable road user detection implementing driver warning and vehicle control strategies to avoid, or at least minimise, the impact of a crash.
- The [project WATCH-OVER](#), whose goal was the design and development of a cooperative system for the prevention of accidents involving vulnerable road users in urban and extra-urban areas based on short range communication and vision sensors.

Finally, pedestrian protection has received additional weight within the new [Euro NCAP](#) rating scheme (see Measure 20), which provides a strong incentive for the voluntary implementations of vehicle safety

measures. The new overall rating, which includes pedestrian protection, forces car-makers to improve pedestrian protection if they want to receive 4 or 5 star ratings in the future.

**Classification:** *EU norm/technical specification.*

### State of implementation

Duration of the SAVE-U project: from 1 March 2002 to 30 September 2005.

Duration of the WATCH-OVER project: from January 2006 to December 2008.

Regarding the application of the Regulation 78/2009, the timetable for varies in function of the vehicles type from 24 November 2009 to 24 August 2019.

Compliance with the requirements of the Regulation becomes mandatory from the dates indicated in the following table.

**Table A. 3: Mandatory dates for the implementation of Regulation 78/2009**

Vehicle Type	Requirement	New Type Approvals	New Registrations
M1 Category vehicles with a GVW not exceeding 2500 kg	Mandatory fitment of brake assist systems	24/11/2009	24/02/2011
	Mandatory compliance with Stage 1 limits	24/11/2009	31/12/2012
	Mandatory compliance with Stage 2 limits	24/02/2013	24/02/2018
M1 Category vehicles with a GVW exceeding 2500 kg	Mandatory fitment of brake assist systems	24/11/2009	24/02/2011
	Mandatory compliance with Stage 2 limits	24/02/2015	24/08/2019
N1 Category vehicles derived from M1 Category vehicles with a GVW not exceeding 2500 kg	Mandatory fitment of brake assist systems	24/11/2009	24/02/2011
	Mandatory compliance with Stage 1 limits	24/11/2009	31/12/2012
	Mandatory compliance with Stage 2 limits	24/02/2013	24/02/2018
Other N1 Category vehicles	Mandatory fitment of brake assist systems	24/02/2015	24/08/2015
	Mandatory compliance with Stage 2 limits	24/02/2015	24/08/2019

By 24 February 2014, the Commission shall review the feasibility and application of these enhanced passive safety requirements and the functioning of this Regulation with regard to the use and effectiveness of brake assist and other active safety technologies.

*Medium advancement*

### Impact on road safety

**Type of impact:** *direct.*

**Timing of the effects:** *medium term.*

**Consistency with other measures:** the scope of this measure is consistent with the actions carried out in the framework of Euro NCAP (Measure 20) and with the research in the domain of the eSafety initiative.

### Ex-post evaluation

#### Outcomes



The EC Regulation 78/2009 on pedestrian protection is adopted.

The project SAVE-U produced 23 public deliverables and several other documents for dissemination purpose, all available on the project website. The final results of the project were presented in the workshop held in Great Britain on August 2005.

The project WATCH-OVER produced 8 public deliverables and several confidential scientific papers, all available on the project website.

**Effectiveness:** *medium.*

It is too early to assess the impact of the Regulation 78/2009. However, it is expected to reduce the severity of accidents involving pedestrian or cyclists thanks to improved car design.

The research carried out within the projects SAVE-U and WATCH-OVER is likely to give a positive impulse to car technological improvements in the future.

**Efficiency:** *not computable.*

SAVE-U project cost: 8,015,235 euro.

SAVE-U project EC funding 4,007,616 euro.

WATCH-OVER project cost: 5,910,000 euro.

WATCH-OVER project EC funding 3,320,000 euro.

**Sustainability:** *medium.*

Vehicle design improvements for cyclists and pedestrian protection are expected to impact on road safety in the long run as far as the vehicle fleet is well maintained and renewed at adequate pace.

## Results

**Description of the impact:** Regulation 78/2009 is expected to reduce the severity of accidents involving pedestrian or cyclists thanks to improved car design and to a mandatory increase in safety performance. The research carried out within the projects SAVE-U and WATCH-OVER, instead, is expected to reduce the severity of accidents involving pedestrian or cyclists thanks to the application of new technologies.

**Contribution to road safety:** *high results.*

**What remains to be done (ERSAP 2011-2020):** the research on new technologies and on a more effective car design to reduce the severity of accidents involving pedestrians and cyclists needs to be deepened.

## Sources

EuroNCAP website

SAVE-U website

WATCH-OVER website

Regulation 78/2009 of the European Parliament and of the Council on the type-approval of motor vehicles with regard to the protection of pedestrians and other vulnerable road users, amending Directive 2007/46/EC and repealing Directives 2003/102/EC and 2005/66/EC, 14 January 2009

Commission Regulation (EC) 631/2009 laying down detailed rules for the implementation of Annex I to Regulation (EC) 78/2009 of the European Parliament and of the Council on the type-approval of motor vehicles with regard to the protection of pedestrians and other vulnerable road users, amending Directive 2007/46/EC and repealing Directives 2003/102/EC and 2005/66/EC, of 22 July 2009

Directive 2005/66/EC of the European Parliament and of the Council relating to the use of frontal protection systems on motor vehicles and amending Council Directive 70/156/EEC, 26 October 2005

Directive 2003/102/EC of the European Parliament and of the Council relating to the protection of pedestrians and other vulnerable road users before and in the event of a collision with a motor vehicle and amending Council Directive 70/156/EEC, 17 November 2003

UNECE, Regulation 13, Revision 6, Agreement concerning the adoption of uniform technical prescriptions for wheeled vehicles, equipment and parts which can be fitted and/or be used on wheeled vehicles and the conditions for reciprocal recognition of approvals granted on the basis of these prescriptions, Uniform provisions concerning the approval of vehicles of categories M, N and O with regard to braking, E/ECE/324, 14 January 2008

TRL, Automated emergency brake systems: technical requirements, costs and benefits, April 2008

CLEPA, Position on Advanced Emergency Braking Systems, Proposal for draft amendments to UNECE Regulation 13, GRRF-S08-03, GRRF-S08-04, GRRF-S08-05, GRRF-S08-06, 9 December 2008

European Commission, Proposal on the General Safety of Motor Vehicles for draft amendments to UNECE Regulation 13, GRRF-S08-07, 9 December 2008

## **Measure 24 Study the causes of and ways of preventing whiplash injuries**

**Objective:** reducing the severity of car accidents.

### **Description**

Neck injuries resulting from car crashes, or whiplash associated disorders, are a serious traffic safety issue with huge costs for the individual as well as for society. It is recognised that important progress in neck injury mitigation could be achieved by improving the use, design and efficiency of seats and head restraints in vehicles.

To this aim, the European Enhanced Vehicle-safety Committee (EEVC) carried out several studies concerning whiplash injuries in order to support the development and enhancement of European safety standards and legislation. A dedicated working group (WG20) was formed with the aim of developing test procedures for rear-end collisions, with a prime focus on neck injury reduction.

The specific activities to be carried out by WG20 are:

- 1) developing a static test of head restraint geometry;
- 2) developing a dynamic test of head restraint geometry;
- 3) developing a dynamic injury prediction test procedure;
- 4) Contribute to the Global Technical Regulation Informal Working Group on head restraints.

Moreover, there are studies funded in the framework of other research projects, as the project Whiplash I & II and the project ADSEAT.

The Whiplash I project (reduction of neck injuries and their societal costs in rear end collisions) developed a test and design method for whiplash protection. However, this method considers the loading phase of rear-end collisions only.

The project was followed by Whiplash II (Development of new design and test methods for whiplash protection in vehicle collisions), aiming at minimising the incidence and risk of neck injuries in frontal and oblique impacts as well as in the rebound phase of a rear-end collision, and at integrating this with the recently developed methods for the loading phase of rear-impact collisions. The objective was reducing the risk and costs of low-severity neck injuries in car collisions by at least 40% by means of the introduction of safer vehicle designs.

The study Multi-disciplinary Design Optimization of Adaptive Vehicle Safety Systems for Whiplash Associated Disorders (MDO-WAD), funded under the Sixth Framework Programme, proposes to develop a design methodology incorporating the contribution of vehicle design factors (such as vehicle structural characteristics, seat geometry and material, etc.) to all four phases (retraction, extension, rebound and protraction) of whiplash, and to optimise vehicle safety, minimizing injury potential. Also, the adaptability of safety system to occupant size and gender is one of the major project undertakings.

The project ADSEAT (adaptive seat to reduce neck injuries for female and male occupants), funded under the Seventh Framework Programme, aims at evaluating adaptive anti-whiplash systems in particular for females. In fact it emerged that this part of the population is at higher risk than males for these injuries (the difference in risk is between 40-100%), but when assessing the vehicle safety the only

available occupant model for these impact scenarios is an average male. Its objective is to establish the properties for a model of an average female and to implement those in a computational model for low severity testing, in addition to the male model that already exists.

Finally, since January 2009, rear impact tests and whiplash rating have been introduced in the new Euro NCAP rating system in the Adult Protection score.

**Classification:** *thematic study.*

### State of implementation

Up to now, the EEVC working group has been working on the first assignment.

Duration of the project Whiplash II: from 1 March 2001 to 31 August 2004.

Duration of the project MDO-WAD: from 1 April 2007 to 31 March 2009.

Duration of the project ADSEAT: from 1 October 2009 to 31 March 2013.

*Medium advancement*

### Impact on road safety

**Type of impact:** *indirect.*

**Timing of the effects:** *medium term.*

**Consistency with other measures:** the results of the research on whiplash injuries will enable further progress in vehicle design and in the testing activity of Euro NCAP (see Measure 20).

### Ex-post evaluation

#### Outcomes

The project Whiplash I, Whiplash II and MDO-WAD have been finalised.

The ADSEAT project is still in progress.

The EEVC study is still ongoing; up to date, the WG20 produced six reports related to the first specific activity.

**Effectiveness:** *high.*

Whiplash injuries constitute a serious problem with implications for the individual as well as for society as a whole. They account for approximately 65% of all injuries in road traffic and the number of this kind of injuries has grown over the last twenty years, despite the fact that the number of people injured in traffic accidents decreased in this timeframe (ETSC, 2007). Yearly, more than 300,000 European citizens suffer neck problems from these injuries and 15,000 result in long terms consequences. It is estimated that whiplash injuries cost the EU15 at least 10 billion EUR a year (ETSC, 2007).

It is calculated that effective whiplash protection systems could reduce the risk of a neck injury up to 50%. Applying this percentage to the number of injured people per year, it can be estimated that about 150,000 whiplash injuries could be avoided yearly thanks to a wide deployment of such systems.

**Efficiency:** *medium.*

Whiplash II project cost: 3,662,876 euro.

Whiplash II project EC funding: 2,087,300 euro.

MDO-WAD project cost: n.a.

MDO-WAD project EC funding: 80,000 euro.

ADSEAT project cost: 3,762,616 euro.

ADSEAT project EC funding: 2,500,000 euro.

The research was proved to be quite expensive in this domain, but still without a full application of the proposed solutions in the vehicle testing and design.

**Sustainability:** *high.*

The results of the research will provide the basis for further studies and is expected to impact the evolution of vehicle design in the future.

## Results

**Description of the impact:** the research supports the development and enhancement of European safety standards for vehicles design.

**Contribution to road safety:** *medium results.*

**What remains to be done (ERSAP 2011-2020):** EuroNCAP has introduced an evaluation of the efficiency of whiplash protection systems. The automotive industry should translate into action the outcomes of research, once finalised.

## Sources

EuroNCAP website

EEVC website

IST Portal

European Transport Safety Council (ETSC), Reining in Whiplash - Better Protection for Europe's Car Occupants, 2007

European Enhanced Vehicle-safety Committee (EEVC), Summary Report: Requirements and Assessment of Low-Speed Rear Impact Whiplash Dummies, October 2008

European Enhanced Vehicle-safety Committee (EEVC), Dummy Requirements and Injury Criteria for a Low-speed Rear Impact Whiplash Dummies, September 2007

European Enhanced Vehicle-safety Committee (EEVC), Static Test of Head Restraint Geometry: Test Procedure and Recommendations, September 2007

European Enhanced Vehicle-safety Committee (EEVC), Review of Recommendations regarding the use of Hybrid III in Low-speed Rear Impact Whiplash Tests, September 2007

European Enhanced Vehicle-safety Committee (EEVC), WG20, UK Cost-benefit Analysis: Enhanced Geometric Requirements for Vehicle Head Restraints, September 2007

European Enhanced Vehicle-safety Committee (EEVC), Updated State-of-the-Art Review on Whiplash Injury Prevention, October 2005

## Measure 25 Support the development of smart restraint systems

**Objective:** improving safety of car occupants.

### Description

Traditional safety belts and air bags are set up to provide protection by deploying in a fixed manner. Advanced restraint systems, on the contrary, consider variables such as occupant weight, seating position, safety-belt usage and vehicle deceleration to control belt forces and deploy the air bag optimally. For example, many new air-bag systems are designed to not deploy into unoccupied seating positions or when an occupant is out of the normal seating position and to fill at different speeds and to different volumes.

The PRISM project (Proposed Reduction of car crash Injuries through improved SMart restraint development technologies) was designed to facilitate the efficient and effective development of smart restraint systems for Europe. The project, funded under the Fifth Framework Programme and involving industrial and academic partners from five European countries, was set up to assess the potential benefits of smart systems in real world situations and to develop guidelines for the future testing of such systems.

The testing and evaluation of smart restraint systems is not taken into account by the Euro NCAP rating system yet.

**Classification:** *technical specification.*

### State of implementation

Duration of the project PRISM: from 12 January 2002 to 3 September 2005.

*Medium advancement*

### Impact on road safety

**Type of impact:** *indirect.*

**Timing of the effects:** *medium term.*

**Consistency with other measures:** the results of the research on smart restraint systems will enable further progress in vehicle design. The aim is consistent with the general objective of increasing the car occupants' safety.

### Ex-post evaluation

#### Outcomes

PRISM produced a series of data sheets which covered different injury scenarios (with information on injury mechanisms, injury causation and frequency of injury in a user-friendly manner) with the aim of helping the industry in the effective development of smart restraint technologies. To this aim, 230 tests were undertaken in an instrumented test vehicle.

**Effectiveness:** *high.*

A study (TRL, TNO, 2005) demonstrated that if it were possible to adapt restraint characteristics to the specific occupant size, injury risk could be lowered.

**Efficiency:** *medium.*

PRISM project cost: 2,747,010 euro.

PRISM project EC funding: 1,695,646 euro.

The research has not yet lead to large market introduction of smart restraint systems.

**Sustainability:** *high.*

## Results

**Description of the impact:** the results of the research should enable further progress in vehicle safety performance, increasing the level of the occupants' protection in case of accident.

**Contribution to road safety:** *medium results.*

**What remains to be done (ERSAP 2011-2020):** research should be deepened and the application of the results should be supported in collaboration with the automotive industry.

The testing of smart restraint systems, once installed in the majority of vehicles, could be included in the Euro NCAP rating system.

## Sources

EuroNCAP website

TRL, TNO, Paper 05-0097, A numerical investigation into the effectiveness of “smart” restraint systems in mitigating injury risk under “real work” accident conditions, 2005



## **Measure 26 Adapt to technical progress the front, side and rear-end impact directives for lorries to limit vehicle under-run, and introduce energy absorption criteria**

**Objective:** reducing the severity of truck accidents.

Due to the size and mass of heavy good vehicles, the problem of compatibility with occupants of other vehicles and vulnerable road users is a main issue.

EU requirements have been introduced in the past mandating front, rear and side under-run protection for trucks with a gross weight over 3.5 tonnes (Directives 2000/40, 70/221 and 89/297 respectively).

The intent of amending those Directives in the light of the reached technical progress and to introduce the concept of energy absorption criteria (which had to be carried out by the DG Enterprise) has seen a stop because of the success of voluntary industry implementations in the framework of Euro NCAP.

Of particular interest is the development of the “soft nose” concept for heavy goods vehicles, that is being studied with the DG Enterprise. The “soft nose” is a safety measure designed to absorb the energy of the impact in case of trucks collisions.

Suggestions for improving rear and side under-run safety was also developed in the framework of the project VC Compat (see Measure 27 for details), which studied test procedures regarding car-to-truck impact to assess and control truck frontal structures for frontal impact compatibility with cars.

The project APROSYS (Advanced Protection Systems) contributed as well to the development of protection systems for front and side impacts involving heavy trucks.

**Classification:** *technical specification.*

### **State of implementation**

Duration of the project APROSYS: from 1 January 2004 to 1 December 2009.

Energy absorbing systems are available from all truck manufacturers as an optional device but almost none are sold (ERSO).

The amendment of the concerned Directives has been temporarily suspended.

*Low advancement*

### **Impact on road safety**

**Type of impact:** *direct.*

**Timing of the effects:** *short term.*

**Consistency with other measures:** the aim is consistent with the general objective of reducing the severity of the consequences of accidents involving trucks.

## Ex-post evaluation

### Outcomes

The project APROSYS produced numerous public deliverables, of which five are dedicated to passive safety strategies for heavy goods vehicles. In particular, it analysed and evaluated the design possibilities regarding injury protection systems for pedestrians and cyclists on commercial vehicles (APROSYS, 2006). Design concepts as well as add-on solutions for existing heavy vehicles were collected and advanced. The results show that the current developments mainly focus on systems related to the active safety, while additional solutions related to the passive safety are not really regarded.

#### **Effectiveness:** *medium.*

Several studies have shown that energy-absorbing front, rear and side under-run protection could significantly reduce deaths and serious injuries.

ETSC estimated (ETSC, 2001) that energy absorbing front under-run protection systems could save more than 1,000 fatalities per year; improved rear under-run protection systems could save a third of related fatalities per year and improved side under-run protection systems could save 45% of related vulnerable road users fatalities per year.

TRL estimated (TRL, 2001) that energy-absorbing front, rear and side under-run protection could reduce deaths in car to lorry impacts by about 12%.

In regards to car-to-truck collisions, a study performed by EEVC WG 14 indicates a 20-30% reduction in fatalities where the trucks are equipped with a rigid or energy absorbing under-run device.

In addition, estimates of EEVC WG14 on under-run protection devices have indicated that improved rear under-run protection systems with a lower ground clearance as well as higher test forces would reduce fatally and severely injured car occupants by a third in rear under-run impacts in Europe.

#### **Efficiency:** *low.*

Research showed that the benefits of a mandatory specification for energy absorbing front under-run protection would exceed the costs, even if the safety effect of these measures was as low as 5% (Elvik, 1999).

Most importantly, according to researches carried out in the Netherlands (SWOV, 1999 and SWOV, 2004), the existing legislative requirement for side under-run protection is limited and an improved system could reduce pedestrian and cyclist deaths in case of accident with trucks by about 10%. In addition, protection needs to be provided in side collisions with cars and motorcycles.

APROSYS project cost: 30,230,000 euro.

APROSYS project EC funding: 18,000,000 euro.

#### **Sustainability:** *medium.*

The fact that the introduction of energy absorption criteria is left to voluntary actions may represent a risk of lost of interest by the part of the involved actors in the long run. A legislative framework would secure a more stable environment.

## Results

**Description of the impact:** the results of the research on energy absorption systems will enable further progress in HGVs' design, reducing the severity of the accidents involving trucks. The review of the concerned Directives should provide a clear and certain legislative framework to foster the implementation of these systems.

**Contribution to road safety:** *medium results.*

**What remains to be done (ERSAP 2011-2020):** the existing legislative framework for front, side and rear-end protection should be adapted in light of the results achieved by the research.

## Sources

EuroNCAP website

APROSYS website

ETSC, Fact Sheet Number 7, The Safety of Heavy Duty Vehicles, September 2005

ETSC, Priorities for EU motor vehicle safety design, June 2001

COWI, Cost-benefit assessment and prioritisation of vehicle safety technologies, Final Report, January 2006

APROSYS, Heavy Goods Vehicle vs. Vulnerable Road Users Aggressivity Index, Final, 18 February 2009

APROSYS, Strategies for enhanced pedestrian and cyclist friendly design, April 2006

Elvik R., Cost-benefit analysis of safety measures for vulnerable and inexperienced road users, Institute of Transport Economics, Work Package 5 of EU-project PROMISING, 1999

TRL, Report No.498, A review of fatal accidents involving agricultural vehicles or other commercial vehicles not classified as a goods vehicle, 2001

SWOV, The safety of trucks; an analysis of accidents and measures commissioned by the sector organization Transport and Logistics Netherlands, Report R-99-31 [only in Dutch], 1999

SWOV, Cost-benefit analysis of measures for trucks, Report R-2004-11 [only in Dutch], 2004

Directive 2000/40/EC of the European Parliament and of the Council on the approximation of the laws of the Member States relating to the front under-run protection of motor vehicles and amending Council Directive 70/156/EEC, 26 June 2000

Directive 70/221/EEC of the Council on the approximation of the laws of the Member States relating to liquid fuel tanks and rear protective devices for motor vehicles and their trailers, 20 March 1970

Directive 89/297/EEC of the Council on the approximation of the laws of the Member States relating to the lateral protection (side guards) of certain motor vehicles and their trailers, 13 April 1989

## **Measure 27 Make vehicles more compatible**

**Objective:** improving car occupant safety.

### **Description**

Traffic related accidents are still a major issue: in 2007, more than 42,000 people died on the roads and over 1.2 million of accidents caused personal injuries (CARE data). Of those fatalities, about 80% are car occupants fatalities, with small deviations per country<sup>6</sup>, and 50-60% of those (i.e. 15,000 people) die in car-to-car or car-to-truck collisions. Therefore, there remains much potential benefit for improving vehicle crash compatibility (described by the self protection level and the structural interaction) and car occupant safety.

Two research projects funded by the Commission have specifically addressed the issue of vehicle compatibility.

The project VC-COMPAT (Improvement of Vehicle Crash Compatibility through the Development of Crash Test procedures), funded under the Fifth Framework Programme, aimed at developing crash test procedures regarding car-to-car and car-to-truck impact, in order to lead to an improvement in vehicle crash compatibility.

It accomplished the following specific tasks:

- drawing up a suite of draft test procedures and associated performance criteria;
- building a framework for a crash compatibility rating system;
- improving the understanding for vehicle crash compatibility with general recommendations for the design of compatible cars;
- identifying the benefits and costs of improved compatibility for both cars and trucks.

Taking into account the VC-COMPAT project activities, the project FIMCAR deepened the research, testing different approaches for the assessment of compatibility. Both are composed of an off-set and a full overlap test procedure. In addition another approach (tests with a moving deformable barrier) is getting more and more in the focus of present research programmes.

Within this project different off-set, full overlap and MDB test procedures are analysed in order to propose a compatibility assessment approach which will be accepted and shared by the involved industry and research organisations.

The development work will be accompanied by harmonisation activities to include research results from outside the consortium and to early disseminate the project outcomes.

Beside the research carried out in the projects mentioned above, an important incentive for implementing technical measures aimed at vehicles compatibility comes from Euro NCAP, which tests each vehicle simulating car-to-car frontal and side impacts. A test to assess car-to-truck impacts has not been developed in the framework of Euro NCAP, yet.

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<sup>6</sup> Calculated on EU27 CARE data, excluding BG, LT, RO, SI, SK (not available).

**Classification:** *technical specification.*

### State of implementation

Duration of the project VC-COMPAT: from 1 March 2003 to 1 March 2006.

Duration of the project FIMCAR: from 1 October 2009 to 30 September 2012.

*Low advancement*

### Impact on road safety

**Type of impact:** *direct.*

**Timing of the effects:** *medium term.*

**Consistency with other measures:** the scope of this measure is consistent with the action carried out by Euro NCAP.

### Ex-post evaluation

#### Outcomes

The project VC-COMPAT produced 21 public deliverables. The outcome of the project was presented and discussed together with the car and truck industry at the final workshop held in Eindhoven, The Netherlands, the 17<sup>th</sup> and 18<sup>th</sup> of October 2006.

The project FIMCAR has just started recently.

At present, although compatibility has been analysed worldwide for years, no final assessment approach is still defined.

**Effectiveness:** *high.*

Concerning car to car impact, it is estimated (VC-COMPAT, 2007) that improved frontal compatibility could save between 721 and 1,332 lives and could reduce seriously injured casualties between 5,128 and 15,383 per year in the EU15<sup>7</sup>.

**Efficiency:** *medium.*

VC-COMPAT project cost: 5,836,008 euro.

VC-COMPAT project EC funding: 3,000,000 euro.

FIMCAR project cost: 6,026,777 euro.

FIMCAR project EC funding: 3,804,598 euro.

The cost of improved compatibility was estimated based on the costs required to modify a current car to meet assumed compatibility requirements. The cost-benefit ratio was predicted to be between about 4.5 and 0.5. It should be noted that this cost-benefit was calculated for the steady state, when the entire

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<sup>7</sup> Analysis based on Great Britain and German accident data only.

vehicle fleet is compatible, and that the benefit will be less during the initial years (VC-COMPAT, 2007).

**Sustainability:** *high.*

The expected results of the research activity are likely to produce a positive impact on safety in the medium and long term.

## Results

**Description of the impact:** Improved vehicle compatibility could reduce the number of serious injuries and fatalities by as much as a third in accidents where a car collides with another vehicle. It is also expected that the structural improvements increase protection in many single-vehicle accidents (VC-COMPAT, 2007).

**Contribution to road safety:** *high results.*

**What remains to be done (ERSAP 2011-2020):** the measure should be continued.

## Sources

EuroNCAP website

VC-COMPAT website

FIMCAR website

IST Portal

VC-COMPAT, Final Report, 15 February 2007

## **Measure 28 Examine the impact on road safety of the proliferation of 4x4s, sports utility vehicles and multi-purpose vehicles**

**Objective:** support policy-making.

### **Description**

The number of 4x4s, multi-purpose vehicles (MPV) and sport utility vehicles (SUV) is growing. For example, in western Europe (EU15 and EFTA countries) the share of 4x4 in new car registrations has been significantly growing since the end of the Nineties, from about 3% of all the cars registered in 1997 to about 10% in 2007 (ACEA statistics<sup>8</sup>). Between 2008 and 2009 this share showed a reduction to 8% reasonably attributable to economic slowdown, but it can be expected to increase again once consumers' confidence recovers.

The issue is that the safety and environmental performance of these vehicles are not in line with modern European passenger cars. According to a recent study conducted in the US (Insurance Institute for highway safety, 2007), cars almost always have lower death rates than pickups or SUVs.

A first contribution to the analysis of the impact on road safety of 4x4s, sports utility vehicles and multi-purpose vehicles was developed in the framework of the project ROLLOVER (Improvement of rollover safety for passenger vehicles), funded under the Fifth Framework Programme. The project aimed to develop effective rollover systems in a cost efficient manner in order to provide increased occupant safety. It covered various types of rollover accidents, including injury mechanisms and protection methods, targeting passenger cars, SUV, MPV and Minivans. The main results have been an electronically rollover database and the categorization on rollover scenarios, best practice instruction for numerical and experimental test methods and a physical demonstrator on rollover occupant safety.

Later on, the Commission funded a research project specifically addressed to the aim of this measure. The project IMPROVER (Impact Assessment of Road Safety Measures for Vehicles and Road Equipment), and in particular the Subproject 1, examined the impact on road safety (and the environmental issues) due to the increasing use of sports utility and multi-purpose vehicles.

**Classification:** *thematic study.*

### **State of implementation**

Duration of the project ROLLOVER: from 1 July 2002 to 30 June 2005.

Duration of the project IMPROVER: from 23 November 2004 to 23 May 2006.

*High advancement*

### **Impact on road safety**

**Type of impact:** *indirect.*

**Timing of the effects:** *medium term.*

<sup>8</sup> ACEA does not provide specific data for SUVs and MPVs categories.

**Consistency with other measures:** the scope of this measure is strictly linked with the enhancement of vehicle compatibility (see Measure 27). The research implementation is closely connected with the studies carried out in the framework of the Measure 56 (examine the impact of the growing use of small commercial vehicles and company vehicles).

## Ex-post evaluation

### Outcomes

The research carried out within the project IMPROVER (IMPROVER, 2006) showed that there is a higher safety risk with SUVs in collisions with other road users as compared to collisions between other passenger cars and other road users. Instead, there are no distinctive trends observable for the MPV car category.

The source of this higher safety risk in road accidents is the misalignment of crashworthy structures, significant mass differences between the SUV and the other vehicles, and incompatible structural stiffness.

Besides the safety aspects, there is concern that SUVs and MPVs might have a poorer environmental performance than other cars.

**Effectiveness:** *medium.*

The research in this domain still has not received any follow-up.

**Efficiency:** *medium.*

IMPROVER project cost: 1,402,571 euro.

ROLLOVER project cost: 3,418,274 euro.

ROLLOVER project EC funding: 2,099,995 euro.

The research was proved to be quite expensive in this domain, but still without a full application of the proposed solutions in the vehicle testing and design.

**Sustainability:** *medium.*

The expected results of the research activity are likely to produce a positive impact on safety in the medium and long term.

## Results

**Description of the impact:** understanding the effects on road safety of the proliferation of 4x4s, sports utility vehicles and multi-purpose vehicles is crucial to define the intervention strategy that needs to be adopted in order to increase road safety.

**Contribution to road safety:** *low results.*

**What remains to be done (ERSAP 2011-2020):** the increase of SUVs and MPVs in the EU countries should be further monitored and investigated. To this end, it would be helpful a clear distinction between passenger cars and SUVs in sales numbers.



The safety risk highlighted by IMPROVER can be avoided with the introduction of compatibility based safety requirements, in particular for SUVs. Activities like VC-Compat (see Measure 27) can be used to drive these solutions forward.

In addition, the research should be extended to include in the analysis the proliferation of electric cars.

## Sources

EuroNCAP website

ACEA website

IMPROVER, Final Report of the Subproject 1, Impact on road safety due to the increasing of sports utility and multipurpose vehicles, April 2006

Insurance Institute for highway safety, Vol. 42, No. 4, Driver deaths by make and models: fatality risk in one vehicle versus another, 19 April 2007

## **ACTIVE SAFETY OF VEHICLES**

Measure 29: Examine the wide-scale use of daytime running lights on all vehicles

Measure 30: Improve the visibility of heavy duty vehicles

Measure 31: Eliminate blind spots towards the rear for drivers of heavy duty vehicles

Measure 32: Assess measures to reduce tyre-related accidents

Measure 33: Examine driver impairment detection devices, e.g. alcohol ignition interlocks ('alcolocks') and driver fatigue detectors

Measure 34: Examine national trials of intelligent speed adaptation devices and assess their acceptability to the public

Measure 35: Improved motorcycle safety through legislation or voluntary agreements with the industry

Measure 36: Examine the benefits of harmonising the approval of adaptations to vehicles for persons with reduced mobility

Measure 37: Adopt a long-term plan concerning information and communication systems in the field of road safety and establish the necessary regulatory framework for implementing such systems

Measure 38: Identify priority areas for the development and implementation of performance standards to optimise the man-machine interface and the road safety potential of telematics applications. Ensure compliance with the declaration of principles concerning the human-machine interface

Measure 39: Examine, together with the Member States, the need to include new onboard electronics systems in roadworthiness testing

Measure 40: Determine and encourage best practices so as to improve the efficiency of periodic compulsory inspections at the lowest cost

## **Measure 29 Examine the wide-scale use of daytime running lights on all vehicles**

**Objective:** assessing the use of daytime running lights on vehicles in Member States.

### **Description**

In 2006 there were fourteen European countries with mandatory use of daytime running lights (DRL). Some Member States recommend the use of DRL without mandating them and waiting for harmonised European legislation.

The consultation paper “Saving Lives with Daytime Running Lights” (EC, Directorate General for Energy and Transport, 2006) sought views on the mandatory use and the installation of automatic dedicated DRL on all motor vehicles (also trucks and busses, mobile machinery, small four-wheeled vehicles, tractors, etc.) in circulation on EU roads.

The report “Road Safety Performance Indicators: Theory” (Hakkert et al, 2007) provided details about the theory behind the development of safety performance indicators (SPIs) in seven predefined road safety domains, including daytime running lights (DRL). The report “Safety Performance Indicators for Daytime Running Lights: Theory Update” (Hollo P., Gitelman V., 2008) presented an update to the basic SPIs theory report, in part concerning the development of the DRL SPIs. This reports summed up the general theory behind the development of the DRL SPIs, including a more detailed insight into the reported effects of DRL on vulnerable road users (pedestrians, two-wheelers).

It is noteworthy to mention the European Commission Directive 2008/89 which amended, for the purposes of its adaptation to technical progress, the Council Directive 76/756/EEC concerning the installation of lighting and light-signalling devices on motor vehicles and their trailers. At the basis for Directive 2008/89 there were the results of the project DRL, funded by DG TREN and carried out from 1 January 2003 to 1 January 2004.

**Classification:** *thematic studies/ EU norm.*

### **State of implementation**

The EC consultation paper was carried out in 2006, the report “Safety Performance Indicators for Daytime Running Lights: Theory Update” in 2008.

The Directive 2008/89 has been emanated on the 24 September 2008 with effect from 7 February 2011.

*High advancement*

### **Impact on road safety**

**Type of impact:** *indirect.*

**Timing of the effects:** *medium term.*

**Consistency with other measures:** this measure is connected with Measure 30 and 31 aimed at improving the visibility of the vehicles.

## Ex-post evaluation

### Outcomes

The conclusions of the EC consultation paper can be summarised as follows:

- Research indicates that DRL could help saving between 1,200 and 2,000 lives per year on EU roads. From an environmental and technical as well as from a road safety point of view, there is a strong case for moving forward with a technical requirement to equip all vehicles with automatic dedicated daytime running lights.
- In order to deploy the positive effects of DRL as quickly and thoroughly as possible, consideration should also be given to a user requirement to use dipped-beam headlights or retrofitted dedicated DRL even without an automatic switch and light sensors.
- In order to provide for necessary flexibility, a legislative initiative on DRL could foresee a fixed date for the transposition of the technical requirement to install automatic dedicated DRL on new vehicles and an appropriate period of time to transpose the user requirement for existing vehicles.

The conclusions of the report “Safety Performance Indicators for Daytime Running Lights: Theory Update” are:

- Based on the literature review and recent experiences of several European countries, it can be stated that DRL can contribute to the improvement of road safety. There is no scientific evidence for the frequently mentioned negative effects for vulnerable road users (pedestrians, cyclists or motorcyclists).
- The widespread introduction of DRL could be optimal if the behavioural measures for older vehicles are coincided with the installation of an advanced DRL unit on new cars. This would result in a combination of accident casualty reduction and reduced vehicle emission, especially when LED lamps are used. However, vehicle requirements can only be introduced at the EU level.
- The DRL SPIs are defined as the percentage of vehicles using daytime running lights, where the value is estimated for different road categories and for different vehicle types. The background information on the DRL legislation is essential for a correct interpretation and comparison of the results. For example, comparing the countries’ DRL usage rates it is reasonable to take into account whether the countries have a law/ regulation on obligatory use of DRL and if they do, when and where.
- Besides, in countries where automatic DRL was introduced a long time ago (e.g. Sweden, Norway) current DRL usage rate is close to 100%, thus the DRL usage rate as a behavioural safety performance indicator does not have practical implications any more. In general, once the option of automatic DRL is introduced Europe-wide, the DRL indicators will lose their importance as an indicator of safety performance.

The Directive 2008/89 introduces the obligation for fitting dedicated daytime running lights on motor vehicles in order to increase road safety by improving the conspicuity of these vehicles.

**Effectiveness:** *medium.*

As the Directive 2008/89 addresses only the new vehicles, the impact of this measure depends on the renewal of the EU vehicle fleet.

**Efficiency:** *medium.*

The benefits are expected to overcome the costs, which include as well an increased environmental impact.

**Sustainability:** *high.*

The implementation of DRL systems will be sustained mostly by the automotive sector.

## Results

**Description of the impact:** better visibility of vehicles can reduce the number of accidents.

**Contribution to road safety:** *medium results.*

**What remains to be done (ERSAP 2011-2020):** possible solutions regarding the conspicuity of older vehicles should be investigated.

## Sources

European Commission, Directorate General for Energy and Transport (2006), Saving Lives with Daytime Running Lights

Hollo P. and Gitelman V. (2008), Safety Performance Indicators for Daytime Running Lights: Theory Update. Deliverable D3.11c of the EU FP6 project SafetyNet

European Commission, Directive 2008/89/EC amending, for the purposes of its adaptation to technical progress, Council Directive 76/756/EEC concerning the installation of lighting and light-signalling devices on motor vehicles and their trailers, 24 September 2008

## **Measure 30 Improve the visibility of heavy duty vehicles**

**Objective:** increasing safety performances of HGVs.

### **Description**

Crash investigations show that nearly 5% of severe truck accidents can be traced back to poor conspicuity of the truck or its trailer at night. These accidents can be characterised by the fact that car drivers often fail to recognise trucks or truck combinations driving ahead of them. In most cases trucks are in slow motion, are entering the road or are turning off the road. Different studies showed that trucks can be rendered much more conspicuous by marking their sides and rear using retro reflective marking tape. Conspicuity marking tape is a high performance retro reflective tape which reflects most of the light falling onto it back towards the light source.

The study “Conspicuity of Heavy Goods Vehicles” recommends equipping the side and rear of vehicles heavier than 3.5 tons with a contour marking covering at least 80% of each side and with a line marking when contour marking is impossible. The study also recommends equipping all new vehicles with contour markings and, for the existing vehicle fleet, a transition period for retrofitting of at least six years. According to the study, this would save 165 lives, 857 serious injuries and 1,836 light injuries per year in the EU-15, which would represent a saving of 390 millions euro.

In order to increase road safety by improving the conspicuity of large trucks and their trailers, the European Commission emanated the Directive 2007/35 which amended, for the purposes of its adaptation to technical progress, Council Directive 76/756/EEC concerning the installation of lighting and light-signalling devices on motor vehicles and their trailers.

The results of project CONSPICUITY, funded by DG TREN and regarding the conspicuity of heavy good vehicles, have been the basis for the Directive 2007/35.

It is worth to mention also the project CLARESCO, funded by DG RTD, aimed at improving traffic safety and truck and car drivers’ comfort during night time driving.

**Classification:** *EU norm/projects.*

### **State of implementation**

The Directive 2007/35 was emanated on the 18 June 2007 with effect from 10 July 2011.

Duration of the project CLARESCO: from 1 June 2002 to 31 May 2005.

Duration of the project CONSPICUITY: from 1 December 2003 to 1 December 2004.

*Completed*

### **Impact on road safety**

**Type of impact:** *direct.*

**Timing of the effects:** *medium term.*

**Consistency with other measures:** the measure is consistent with Measure 29 as aims to improving the visibility of vehicles, in particular of heavy duty vehicles.

## Ex-post evaluation

### Outcomes

The Directive 2007/35 introduced the obligation for fitting retro reflective marking on large trucks and their trailers vehicles.

Project CLARESCO provided for safety, ergonomics and comfort recommendations concerning new lighting technologies for truck and car.

**Effectiveness:** *medium.*

**Efficiency:** *high.*

In 2004, the European Commission has commissioned a study (TÜV Rheinland, Conspicuity of Heavy Goods Vehicles) which indicates a positive benefit-cost ratio (between 2 and 4) when the tape is applied to new goods vehicles with a gross vehicle weight exceeding 3.5 tons. The highest benefit-cost ratio was achieved for vehicles exceeding 12 tons. This is due to the fact that larger goods vehicles are above-average involved in accidents compared to their share in the vehicle stock.

Project CONSPICUITY total cost: 176,210 euro

Project CONSPICUITY EC funding: n.a.

Project CLARESCO total cost: 2,999,955 euro

Project CLARESCO EC funding: 1,499,976 euro

**Sustainability:** *high.*

The effects of an improvement of the visibility of heavy duty vehicles through the implementation of the Directive 2007/35 could potentially last in the long term.

## Results

**Description of the impact:** improving the visibility of heavy duty vehicles can have a considerable impact in reducing the number of accidents involving trucks.

**Contribution to road safety:** *medium results.*

**What remains to be done (ERSAP 2011-2020):** monitoring the implementation of the Directive 2007/35 at national level.

## Sources

European Commission, Directive 2007/35 amending, for the purposes of its adaptation to technical progress, Council Directive 76/756/EEC concerning the installation of lighting and light-signalling devices on motor vehicles and their trailers, 18 June 2007

European Transport Safety Council (ETSC) (2006), Fact Sheet, February 2006



## **Measure 31 Eliminate blind spots towards the rear for drivers of heavy duty vehicles**

**Objective:** increasing safety performances of HGVs.

### **Description**

A number of accidents are caused by drivers of heavy goods vehicles who are not aware that other road users are very close to or beside their vehicle. These accidents are often related to a change of direction at crossings, junctions or roundabouts when drivers fail to detect other road users in the blind spots which exist in the area immediately around their vehicles. It is estimated that every year about 400 people in Europe are killed in such circumstances, most of them being vulnerable road users such as cyclists, motorcyclists and pedestrians.

The Directive 2003/97/EC of the European Parliament and of the Council of 10 November 2003 on the approximation of the laws of the Member States relating to the type approval of devices for indirect vision and of vehicles equipped with these devices, whilst having great potential for reducing the number of casualties, affects only newly registered vehicles. In particular according to this Directive since 2006 new vehicle types and respectively since 2007 new vehicles can only be granted approval by the Member States' authorities if they are equipped with a set of mirrors and other systems of indirect fulfilling certain requirements in order to reduce their blind spots. For purposes of adaptation to technical progress, the Directive 2003/97/EC was amended by the Commission Directive 2005/27/EC of 29 March 2005.

Instead the Directive 2007/38/EC of the European Parliament and of the Council regards vehicles which were already in circulation are therefore not subject to the obligations set out in Directive 2003/97/EC.

The project MIRRORS constituted the basis for Directive 2007/38/EC. In fact the objective of the study was to assess the consequences of extending the legislation regarding blind spot mirrors not only to new vehicles, but also to the existing ones.

**Classification:** *technical specification.*

### **State of implementation**

The Directive 2007/38/EC was emanated on 11 July 2007 with effect from 6 August 2007 and not later than 31 March 2009.

Duration of project MIRRORS: from 1 December 2003 to 1 June 2004.

*Completed*

### **Impact on road safety**

**Type of impact:** *direct.*

**Timing of the effects:** *short term.*

**Consistency with other measures:** this measure is consistent with all the active safety actions aimed at making easier the driving task and helping drivers to face dangerous road situations.

## Ex-post evaluation

### Outcomes

In the framework of project MIRRORS a cost-benefit analysis of blind spot mirrors was carried out. The main recommendation of the analysis was to introduce a legislation for the retrofitting of mirrors for both new and existing heavy good vehicles as soon as possible in order to obtain the maximum benefit.

Directives 2003/97/EC and 2007/38/EC introduced the obligation for the retrofitting of mirrors to heavy good vehicles registered in the European Community.

**Effectiveness:** *medium.*

In the EC consultation paper “Fitting blind-spot mirrors on existing trucks” of year 2006 it was estimated that if a legal retrofitting obligation had entered into force by 2008 for the relevant heavy goods vehicle population in operation since 1998, an extra 1,300 lives on European roads would have been saved until 2020.

**Efficiency:** *high.*

Project MIRRORS total costs of: 87,274 euro.

Project MIRRORS EC funding: n.a.

The EU Commission calculated that the cost-benefit ratio of this measure would be in the order of 1:3.5, i.e. a benefit of 3.5 euro for each euro invested. Thereby it is reasonably assumed that the benefits of measure over the time will overcome its costs.

**Sustainability:** *high.*

The effects of the implementation of the mentioned directives are expected to last in the long term.

## Results

**Description of the impact:** increasing the visibility for HGVs’ drivers will directly affect their capacity of facing and managing unexpected traffic situations.

**Contribution to road safety:** *medium results.*

**What remains to be done (ERSAP 2011-2020):** monitoring of the correct implementation of Directives 2003/97/EC and 2007/38/EC. Ensuring that the roadworthiness tests check the correct positioning of mirrors...Investigating the possible difficulties of drivers to use the mirrors.

## Sources

Directive 2003/97 of the European Parliament and of the Council on the approximation of the laws of the Member States relating to the type-approval of devices for indirect vision and of vehicles equipped with these devices, amending Directive 70/156/EEC and repealing Directive 71/127/EEC, 10 November 2003

European Commission, Directive 2005/27/EC amending, for the purposes of its adaptation to technical progress, Directive 2003/97/EC of the European Parliament and of the Council, concerning

the approximation of the laws of the Member States relating to the type-approval of devices for indirect vision and of vehicles equipped with these devices, 29 March 2005

Directive 2007/38 of the European Parliament and of the Council on the retrofitting of mirrors to heavy goods vehicles registered in the Community, 11 July 2007

## **Measure 32 Assess measures to reduce tyre-related accidents**

**Objective:** increasing safety performances of vehicles.

### **Description**

During last year EC proposals regarding issues related to tyres were carried out. In particular the EC proposal COM (2008) 316 concerns type-approval requirements for the general safety of motor vehicles. The general objective of such proposal is to lay down harmonised rules on the construction of motor vehicles with a view to ensuring the functioning of the internal market while at the same time providing for a high level of safety and environmental protection. The proposal aims at enhancing the safety of vehicles by requiring the mandatory fitting of some advanced safety features.

In addition, the EC proposed a legislative measure on consumer information, the proposal COM (2008) 779 later adopted by the Council as Common Position (EC) No 18/2009, regarding the labelling of tyres with respect to fuel efficiency and other essential parameters. A labelling scheme for tyres at EU level aims to respond to the suboptimal market transformation towards fuel efficient tyres arising from lack of information. It would allow consumers to make an informed choice, give incentives to tyre manufacturers to upgrade their products and contribute to awareness-raising. The document has already been finalised and it is waiting for the adoption.

It's also noteworthy to mention the project APOLLO whose goal was to create an intelligent tyre for improving road traffic safety. The objectives were met by integrating innovative sensors into tyres for monitoring tyre condition, road condition and tyre-road condition, developing new solutions for wireless communication between tyre and vehicle and a battery-less power supply, constructing an "intelligent" system by integrating all electronic components.

Other projects to be mentioned are the project TYROSAFE (TYre and Road surface Optimisation for Skid resistance And Further Effects) and the project ITARI (Integrated Tyre and Road Interaction) regarding the implementation of new road surfaces.

**Classification:** *EU initiative/projects.*

### **State of implementation**

The EC proposals, carried out in the 2008, provide useful indications for the introduction of measures to reduce tyre-related accidents.

The proposed EC measures are scheduled to take effect by year 2012.

Duration of the project APOLLO: from 1 March 2002 to 31 May 2005.

Duration of the project ITARI: from 1 February 2004 to 31 January 2007.

Duration of the project TYROSAFE: from 1 July 2008 to 30 June 2010.

*Medium advancement*

### **Impact on road safety**

**Type of impact:** *indirect.*

**Timing of the effects:** *medium term.*

**Consistency with other measures:** This measure is consistent with the general aim of increasing road safety through the improvement of the driving conditions of the vehicles.

## Ex-post evaluation

### Outcomes

The minimum requirements governing rolling resistance, wet grip and external rolling noise provided in the EC Regulation 1222/2009, in force as of November 2012 would guarantee standard levels of tyre quality, while further improvements above these levels would be driven by the labelling scheme present in the other mentioned EC proposal.

The main outcome of the project APOLLO is a novel, innovative and verified prototype of an intelligent tyre system consisting of a tyre, an integrated sensor system, a wireless communication interface and a battery-free power supply.

**Effectiveness:** *high.*

Since the importance of tyres for the safety performances of the vehicles, it's reasonable to assume a high effectiveness as well as a high efficiency of the measure.

**Efficiency:** *high.*

Project APOLLO total cost: 4,749,716 euro

Project APOLLO EC funding: 2,746,656 euro

Project ITARI total cost: 2,115,787 euro

Project ITARI EC funding: 1,700,000 euro

Project TYROSAFE total cost: 1,165,804 euro

Project TYROSAFE EC funding: 1,165,359 euro

The benefits are expected to overcome the costs.

**Sustainability:** *medium.*

In case the output of project APOLLO will find a concrete application, and in case the proposal COM (2008) 316 will be adopted, the impact on road safety are expected to last in the long run.

## Results

**Description of the impact:** if directives based on the described proposal were carried out and “intelligent” tyres were used, the impact on road safety could become relevant.

**Contribution to road safety:** *no results.*

**What remains to be done (ERSAP 2011-2020):** the measure should be continued, monitoring the way by which the information is provided to car users.

## Sources

European Commission, COM (2008) 316, Final Proposal for a Regulation of the European Parliament and of the Council concerning type-approval requirements for the general safety of motor vehicles, 23 May 2008

European Commission, COM(2008) 779, Final Proposal for a Directive of the European Parliament and of the Council on labelling of tyres with respect to fuel efficiency and other essential parameters, 13 November 2008

Common Position (EC) No 18/2009 adopted by the Council, acting in accordance with the procedure referred to in Article 251 of the Treaty establishing the European Community, with a view to the adoption of a Regulation of the European Parliament and of the Council on the labelling of tyres with respect to fuel efficiency and other essential parameters, 20 November 2009

APOLLO project (2005), Intelligent tyre for accident-free traffic, May 2005

### **Measure 33 Examine driver impairment detection devices, e.g. alcohol ignition interlocks ('alcolocks') and driver fatigue detectors**

**Objective:** increasing road safety by avoiding impaired people to drive.

#### **Description**

The Project ALCOLOCK - Alcolock implementation in the European Union had the aim to assess the practical, psychological, social and behavioural impact of alcolocks (alcohol activated vehicle immobilizer) by interviewing the drivers about their experience.

**Classification:** *thematic study.*

#### **State of implementation**

The ALCOLOCK project started in 2004 and ended in 2006.

Nowadays the technology for driver impairment detection devices is to be considered not sufficiently mature.

*Low advancement*

#### **Impact on road safety**

**Type of impact:** *indirect.*

**Timing of the effects:** *medium term.*

**Consistency with other measures:** this measure is consistent with the other measures addressing the issue of impaired driving (Measures 12 and 49).

#### **Ex-post evaluation**

##### **Outcomes**

Regarding the project ALCOLOCK, the European trials showed that it is feasible to implement alcolocks in different commercial and non-commercial contexts, but that a careful preparation of the inclusion process and the follow-up procedures is necessary. Due to the limited number of participants and contexts in which the devices were presently tested, these results and conclusions obviously need further confirmation in future research. The most important conclusions regarding the impact of the alcolock on the various dimensions studied are that:

- Alcolocks appear to be relatively practicable in both commercial and non-commercial contexts. Within the study very few technical problems were encountered in any of the three commercial trials, whereas technical malfunctions of the devices occurred relatively frequently in the non-commercial trials. The most important conclusion regarding the practical impact of the devices is that the majority of the drivers found it easy or very easy to use the alcolock and experienced little or no hindrance from the device. In this respect, it needs to be underscored, however, that the programme requirements were less strict in the non-commercial trials. It still needs to be tested whether the use of alcolocks with optimal circumvention prevention features would still be experienced as equally usable by professional drivers.

- The general acceptance of alcolocks was good or very good in both commercial and non-commercial trials and remained high throughout the entire twelve months of the trial. The impact of the alcolocks on psychological aspects such as drinking habits or drink-driving attitudes was very difficult to assess with the present methodology. From the non-commercial trials there were indications that the alcolock programme had a positive impact on the drivers intentions, but no clear indications that the alcolock had a decisive impact on the driver's actual behaviour.
- Regarding the behavioural impact of the alcolock, the most striking difference between the commercial and non-commercial trials was the incidence of positive breath tests. In the commercial trials relatively few positive tests were recorded and almost all these tests seem to be due to deliberate tests of the device. All together the differences in the occurrence of positive tests seem mainly due to the procedures used to assure the follow-up of the results.
- Regarding the social or sociological impact of the alcolocks, the truck drivers' clientele appeared in general rather indifferent towards the alcolock, whereas bus passengers had a generally positive attitude towards the devices. This confirmed the hypothesis that alcolocks may be marketed as an element of quality improvement. Contrary to the commercial trials, the privacy infringing aspect of the alcolock is perceived as a crucial disadvantage of the alcolock by offenders and alcohol dependent participants.
- An additional review of the literature revealed the most important factors influencing acceptance, implementation, participation and compliance. These factors should also be taken into account when implementing large-scale alcolock programmes in Europe.

From the similarities and differences between commercial and non-commercial contexts for alcolock implementation, it became clear that the impact of the alcolocks depends on the specific circumstances in which the alcolock is used. With respect to these circumstances, the commercial or non-commercial character is only one element. The specific programme conditions that are defined for the alcolock users, the specific procedures used to follow-up the test-results and the possible circumventions, the specific consequences of all the possible events and the specific social or commercial environment and society in which the alcolock is used, are equally important factors determining the impact of the alcolock. All these factors will have to be taken into account in future commercial and non-commercial alcolock applications in Europe.

**Effectiveness:** *low*.

According to FIA, systems currently developed can easily be circumvented.

**Efficiency:** *medium*.

Project ALCOLOCK total cost: 1,194,178 euro

Project ALCOLOCK EC funding: 597,089 euro

The wide-scale deployments of alcolocks systems would be extremely costly.

**Sustainability:** *medium*.

The research is going to support decision making and initiative development in the medium term.



## Results

**Description of the impact:** by preventing impaired persons to drive, impairment detection devices as alcolocks can have a direct positive impact on road safety.

**Contribution to road safety:** *no results.*

**What remains to be done (ERSAP 2011-2020):** the measure should be continued. Alcolocks could be used for very specific targets, as in commercial transport or for young novice drivers.

## Sources

ALCOLOCK project (2006), Deliverable D2 and D3, September 2006

### **Measure 34 Examine national trials of intelligent speed adaptation devices and assess their acceptability to the public**

**Objective:** researching to increase active vehicle safety.

#### **Description**

In-vehicle speed information and warning system can contribute to improved road safety by:

- increasing drivers' awareness of speed limits and speed recommendations, both static and variable (according to dynamic environmental conditions such as weather, traffic, road conditions, etc.);
- reducing the number of vehicles with non-adapted speed and consequently reduce the number of speed-related accidents, especially in speed-sensitive locations with vulnerable users, as urban areas;
- providing system solutions to support the implementation of intelligent speed limits that will contribute to maximising traffic flows on existing infrastructure by dynamically adapting speed limits.

In order to investigate the first priority issues to be addressed at the European level in the domain of intelligent speed adaptation devices, the European Commission launched the project SpeedAlert (Harmonising the in-vehicle speed alert concept definition). The specific objectives of the study on speed warning systems were:

- establishing a common classification of speed limits in Europe relevant to system;
- defining the system and service requirements of in-vehicle speed alert system;
- defining functional specification;
- harmonising definition of speed alert concepts;
- identifying requirement for standardisation.

The project saw the participation of key stakeholders from public and private sectors.

With regard to the assessment of the public acceptance of intelligent speed adaptation (ISA) systems, the SARTRE survey (SARTRE, 2004) illustrated that around a quarter of the European drivers believes that it is “very useful” to have a device that restrains you from exceeding speed limits, just a bit lower than for devices preventing drink-driving and driving when fatigued.

Moreover, to assess the political acceptance of ISA systems, the EU-funded PROSPER project (project for research on speed adaptation policies on European roads) performed a survey among different stakeholders (politicians, governmental institutes, research institutes, pressure groups and commercial groups) in eight EU countries. It is reported that ISA is generally seen as an effective safety measure.

Finally, it has to be noted that practical experiments in Sweden and the Netherlands have shown that the acceptance of ISA increases if concrete experience with it has been gained (ERSO).

**Classification:** *thematic study.*

## State of implementation

Duration of the project SpeedAlert: from 1 May 2004 to 1 April 2005.

Duration of the project PROSPER: from 1 January 2003 to 1 December 2005.

Speed alert applications are entering into deployment.

*High advancement*

## Impact on road safety

**Type of impact:** *indirect.*

The measure aims to study the possible implementation of intelligent speed adaptation devices, with the final objective of increasing drivers awareness of speed limits, therefore reducing the number of vehicles with non-adapted speed and consequently the number of speed related accidents.

**Timing of the effects:** *medium and long term.*

**Consistency with other measures:** in general, this measure is connected with the on-going RTD activities related to infrastructure-vehicle Communication (for example, the projects FRICTION and TRACKSS), intelligent roads (see Measure 46) and incremental map updating (for example, the project FEEDMAP).

SpeedAlert's outcome is closely linked with the scope of the eSafety initiative (see Measure 37), which aims to accelerate the development, deployment and use of Intelligent Vehicle Safety Systems that use information and communication technologies to increase road safety and reduce the number of accidents on Europe's roads, and in particular with the Digital Maps Working Group.

Also, the application of ISA systems is linked to the implementation of the MAPS&ADAS subproject, within the PReVENT Integrated Project, which is developing, testing and validating appropriate methods with regard to the use of digital maps.

## Ex-post evaluation

### Outcomes

The SpeedAlert project produced 16 deliverables, available in the website and a SpeedAlert Forum was organised after the project's completion.

The main results of SpeedAlert are:

1. Classification of speed limit categories relevant to speed alert applications: a common set of speed limits categories have been developed, considering both general and specific speed limits (the latter being fixed or variables). These categories were classified over the different type of roads and compared across different EU countries. The survey showed that throughout Europe an extensive array of speed limits are used.
2. End-user system and service requirements for speed alert applications.
3. Functional architecture and associated technical building blocks.
4. List of recommendations to support successful implementation of speed alert applications.

5. Roadmap for deployment taking into account user needs, technical feasibility and available solutions.
6. General business aspects for different actors and benefits.
7. Requirements for standardisation.
8. Consolidation of broad consensus through the Consultation Group and its dedicated workshops.

Regarding public acceptability, different national trials have shown that users are in favour of ISA applications as they support their driving and prevent involuntary speeding and possible fines. However, to realize a broad market take-up, further work still needs to be done.

According to PROSPER's survey (PROSPER, 2004), the introduction of ISA devices is generally preferred to be implemented among all driver groups, on all road types and on a mandatory basis. Barriers to the implementation of ISA that were identified included technical functioning, applicability to the whole road network and liability issues.

**Effectiveness:** *high.*

According to a study carried out in Sweden involving 5,000 equipped vehicles driven by over 10,000 drivers (Biding & Lind 2002; see also SpeedAlert Work Package 4, 2005), Intelligent Speed Adaptation systems result in better road safety without increasing travel time. The study concluded that if the system was applied to all vehicles there could be 20% fewer road injuries in urban areas.

Another study (Carsten, Tate, 2005) showed that speed alert applications which give a light and sound warning when the driver exceeds the speed limit are expected to reduce the number of injury accidents by about 10% and fatalities by about 18%.

The research will support further results in the future.

**Efficiency:** *high.*

SpeedAlert project cost: 756,669 euro.

SpeedAlert project EC funding: 378,334 euro.

PROSPER project cost: 3,234,655 euro.

PROSPER project EC funding: 1,841,767 euro.

The safety benefits of speed alert applications consist of the saving social costs of accidents. In 2002, SWOV has calculated the safety benefits of speed alert applications in 15 EU countries (the results are listed in the Table above). The benefits range from euro 23 billion for the system with the lowest reduction percentage (14%), to euro 43 billion for the system with the highest reduction percentage (26%).

**Table A. 4: Safety benefits by application type of SpeedAlert**

Application type	Speed limit type	Best estimate of fatal and serious accident reduction (%)	Number of fatal accidents saved	Benefits (billion euro 2002)
Informative	Fixed	14	5,460	23
	Variable	14	5,460	23
	Dynamic	18	7,020	30
Supportive	Fixed	15	5,850	25
	Variable	16	6,240	26
	Dynamic	26	10,140	43

Source: SWOV, 2005

**Sustainability:** *medium.*

## Results

**Description of the impact:** speed alert applications can be beneficial for road safety because they lead to a lower average speed and to reduced speed variance and they reduce amount of maximum speed violations. Moreover, drivers can get a better insight into risk perception in relation to speed.

**Contribution to road safety:** *high results.*

**What remains to be done (ERSAP 2011-2020):** there are still remaining issues that need to be resolved before a general European deployment can be realised:

- ensure the speed limit data collection, access and maintenance at a European level by means of appropriate cooperation between public authorities and service providers. Motorways and main roads are currently generally integrated in digital maps, but speed limits for the complete road networks still need to be procured;
- provide a European harmonised set of variable speed limits enabling drivers to adapt their speed according to the prevailing traffic conditions;
- develop and implement a harmonised infrastructure-vehicle communication that will enable a large range of safety and mobility related applications. Analyse the Human Machine Interface and evaluate how to interact with the driver and other on-board applications;
- promote tax or insurance incentives to strengthen end-user interest in speed alert applications;
- promote, together with the automotive industry, the ISA system application as standard option in all new cars;
- examine the acceptability, feasibility and impacts of a mandatory fitting of intelligent speed adaptation systems to ensure cars do not go faster than 150 km/h, that is 15% faster than the highest enforceable or recommended speed limit in any EU Member State, also in the light of environmental objectives (European Federation for Transport and Environment, 2007).

## Sources

SpeedAlert website

SpeedAlert Project Consortium, Final Report, October 2005

SpeedAlert Project Consortium, Work Package 4, Evolution of SpeedAlert concepts, deployment recommendations and requirements for standardisation, July 2005

Carsten, Tate, Intelligent speed adaptation: accident savings and cost-benefit analysis, Accident Analysis and Prevention, 2005

SWOV, Road safety costs, Fact sheet, 2005

SARTRE 3, European drivers and road risk; Report on principal results, 2004

PROSPER, Final report on stakeholder analysis, 2004

European Federation for Transport and Environment, Regulating CO2 emissions of new cars, July 2007

## **Measure 35 Improved motorcycle safety through legislation or voluntary agreements with the industry**

**Objective:** making motorcycles safer.

### **Description**

Recently two meetings of the Motorcycle Working Group MCWG/ MVEG on Motorcycles have been held, respectively on 27 February 2009 and on 29 June 2009.

A public consultation was launched in December 2008 on the Commission's website and ended on the 28<sup>th</sup> of February 2009. Its purpose was to gather information and views from all relevant stakeholders, including public bodies, the general public, industry and business associations, on the specific elements to be assessed for the future legislative framework on two-, three- and four wheel vehicles of the L-category, envisaged by the Commission services.

These key issues concerning 2-, 3- and 4-wheel vehicles of the L-category can in general be attributed to:

- Complexity of the current legislation for L-category vehicles.

The current legislative text consists of a framework directive (directive 2002/24/EC) and 14 associated implementing directives, all of which have been amended over time.

- High level of emissions.

It is estimated that, quite apart from other aspects, the contribution of L-category vehicles to hydrocarbon emissions will rise to approximately 55% of total hydrocarbons emitted by all road transport vehicles in 2020, if no additional measures will be introduced. This is mainly owing to the significant reduction in emissions from other road transport categories like passenger cars and trucks.

- Road safety, high number of fatalities and seriously injured riders.

In 2006, L-category vehicles accounted for 2% of distance travelled, but for 16% of road deaths. The fatality rate per million kilometres travelled is, on average, 18 times greater than for passenger cars. Furthermore, while other vehicle modes have shown significant decreases in fatalities and serious injuries over time, the figures for L-category vehicles have fallen much less, or have remained static.

The public consultation was based on one questionnaire structured around three main objectives of the legislative proposal: simplification of the legislation (better regulation) to reduce the current complexity, addressing the high level of emissions and introducing safety measures.

With regards to the motorcycles safety, it should be remembered the projects PISA (Powered two-wheeler Integrated Safety) and SIM (Safety in Motion), funded by DG RTD. The project PISA concerns the safety improvements for drivers and passengers of powered two-wheelers (PTWs) motorcycles and mopeds. The project SIM deals with the development of an innovative concept of PTW vehicle with new safety devices.

It is also noteworthy to mention the Directive 2009/67/EC of the European Parliament and of the Council on the installation of lighting and light-signalling devices on two or three-wheel motor vehicles. It aims to increase motorcycles' safety by improving their conspicuity.

**Classification:** *EU initiatives and norm/projects.*

### State of implementation

The Directive 2009/67/EC was emanated on 13 July 2009 and it shall apply from 1 January 2010. Meetings and public consultation document provided indications and recommendations, but without a full convergence about new safety measures to be adopted.

Duration of the project PISA: from 1 June 2006 to 31 November 2009.

Duration of the project SIM: from 1 September 2006 to 31 August 2009.

*Medium advancement*

### Impact on road safety

*Direct*

**Timing of the effects:** *medium term.*

**Consistency with other measures:** the measure aims to improve the safety of motorcyclists and it is consistent with the passive safety measure regarding the use of crash helmets (Measure 18).

### Ex-post evaluation

#### Outcomes

The Directive 2009/67/EC provides for technical prescriptions regarding the visibility of two or three-wheel motor vehicles.

The main outcomes of the meetings and the public consultation was a exchange of views regarding: a new regulatory framework on two and three-wheel motor vehicles; new emission measures; and possible new safety measures such as the mandatory fitting of the anti-lock Braking Systems (ABS), anti-tampering measures, the use of hydrogen vehicles.

**Effectiveness:** *not computable.*

**Efficiency:** *not computable.*

Project PISA total cost: 2,943,730 euro

Project PISA EC funding: 1,850,000 euro

Project SIM total cost: 4,036,404 euro

Project SIM EC funding: 2,199,939 euro

**Sustainability:** *medium.*

### Results

**Description of the impact:** improving the safety for the one of the most vulnerable groups of road users, i.e. the motorcyclists, is expected to have a considerable impact on road safety.



**Contribution to road safety:** *low results.*

**What remains to be done (ERSAP 2011-2020):** this measure should be continued. In particular, stakeholders suggest an implementation on voluntary basis.

#### Sources

Directive 2009/67 of the European Parliament and of the Council on the installation of lighting and light-signalling devices on two or three-wheel motor vehicles, 13 July 2009

European Commission, Draft meeting minutes of the Motorcycle Working Group MCWG/ MVEG on Motorcycles (L category vehicles), 27 February 2009

European Commission, Draft meeting minutes of the Motorcycle Working Group MCWG/ MVEG on Motorcycles (L category vehicles), 29 June 2009

European Commission, Results of the public consultation on a proposal for a new Framework Regulation of the European Parliament and of the Council on type-approval of two-, three- and four-wheel motor vehicles, referred to as L-category vehicles, 1 June 2009

### **Measure 36 Examine the benefits of harmonising the approval of adaptations to vehicles for persons with reduced mobility**

**Objective:** increasing active vehicle safety.

#### **Description**

The project QUAVADIS was a pan-European initiative to improve the Quality and Use Aspects of Vehicle Adaptations for DISabled. The overall objectives of the project were:

- to stimulate knowledge exchange in the field of physically disabled drivers and their need for car-adaptations;
- to establish statistics on the use of codes and the disabled drivers population in Europe;
- to draw up criteria for safety and performance of car-adaptations that are suitable to compensate for the driver's disability according to the restrictive conditions (codes) on the driving licence.

The project PORTARE is a voluntary cooperation between a group of European experts and its main objective is to ease mobility for disabled drivers. In particular the project aims to make the existing knowledge on assessment available by describing:

- the consequences related to fitness to drive for different illness categories
- the criteria for assessment in relation to these consequences
- the criteria for on-road testing in relation to the consequences
- methods to enable assessors to supply the relevant information to decision makers

Furthermore project PORTARE aims to stimulate implementation in all EU countries by means of:

- describing the knowledge and skills needed by assessors to assess the driver / applicant and to supply the relevant information for a decision to the authorities;
- train-the-trainer workshops for information exchange amongst experts in EU;
- establishment of an EU organisation for assessment and on-road testing of drivers / applicants with physical and/or cognitive limitations

**Classification:** *thematic study.*

#### **State of implementation**

The QUAVADIS project started in January 2001 and was completed by June 2003.

*Low advancement*

#### **Impact on road safety**

**Type of impact:** *indirect.*

**Timing of the effects:** *medium term.*

**Consistency with other measures:** the measure is consistent with the general aim of improving the driving conditions of the vehicles.

## Ex-post evaluation

### Outcomes

The main results of QUAVADIS project were a description of the procedures for obtaining or renewing a driving licence for citizens with a (physical) disability in the different Member States of the European Community, and an extensive Code of Practice for car adaptations structured in line with the list of harmonised Community codes on the driving licence.

**Effectiveness:** *low.*

The research in this domain still has not received any follow-up.

**Efficiency:** *low.*

**Sustainability:** *medium.*

## Results

**Description of the impact:** the introduction of proper car-adaptations is expected to make easier the driving task of persons with reduced mobility, thus increasing road safety.

**Contribution to road safety:** *low results.*

**What remains to be done (ERSAP 2011-2020):** studies should be deepened.

## Sources

European for Car Adaptation website

QUAVADIS project (2003), Final Report, 30 June 2003

**Measure 37 Adopt a long-term plan concerning information and communication systems in the field of road safety and establish the necessary regulatory framework for implementing such systems**

**Objective:** improving vehicles safety through the adoption of information and communication systems.

**Description**

Advanced information and communication technologies (ICTs) can be incorporated into onboard “Intelligent Vehicle Systems”, offering new solutions to today’s transport problems. These high-tech systems have great potential to:

- help drivers prevent or avoid traffic accidents;
- mitigate the consequences of accidents that do occur;
- provide drivers with real time information about traffic on road networks, thereby avoiding congestion;
- find the most efficient routes for any journey;
- optimise engine performance, thus improving overall energy efficiency.

In February 2006 the European Commission launched the “Intelligent Car Initiative”, to remove bottlenecks in rolling out intelligent systems and to speed the development of smarter, safer and cleaner transport for Europe. This will be done by:

- building consensus among all the key players involved: citizens, Member States, service providers and the car industry;
- removing legal and institutional barriers;
- stimulating consumer demand for the new onboard technologies.

The Intelligent Car Initiative will accelerate the deployment of intelligent vehicle systems on European and international markets, using a mix of policy, research and communications instruments to:

- ensure interoperability across different EU countries and harmonise technical solutions through a comprehensive European approach;
- support ICT-based research and development in the area of transport and facilitate the take-up and use of research results;
- raise awareness among consumers and decision-makers of the potential benefits of ICT-based solutions.

The eSafety initiative is the first pillar of the Intelligent Car Initiative. It is a joint initiative of the European Commission, industry and other stakeholders. It aims to accelerate the development, deployment and use of intelligent vehicle safety systems that use information & communication technologies to increase road safety and reduce the number of accidents on Europe’s roads.

In the framework of the Programme Creating a User-friendly information society (IST) several projects have been carried out regarding information and communication systems. It should be mentioned the projects: CIBERCARS2, eIMPACT, eSAFETYSUPPORT, ESCOPE (that strengthened the activities of the eSafety initiative), HIGHWAY, HUMANIST, PREVENT.

In addition the projects ASSESS and SAFETRIP will be developed in the framework of Road safety researches FP7 – DG RTD.

Finally, the project BE SAFETY AWARE (Bringing eSafety to the market through awareness) aimed at organising information campaigns to raise awareness among policy-makers and the general public on the benefits of e-safety systems, in order to accelerate the introduction of these electronic life-saving technologies in the market, while the project EVI (Electronic vehicle identification) investigated the feasibility of a Europe-wide electronic vehicle identification system.

On the legislative side, it should be remembered the EC proposal COM (2008) 887, which is a proposal for a directive of the European Parliament and of the Council laying down the framework for the deployment of Intelligent Transport Systems in the field of road transport and for interfaces with other transport modes.

**Classification:** *EU initiative/projects.*

#### State of implementation

The Intelligent Car Initiative was launched in February 2006, while projects of the IST Programme have been carried out in the years 2003-2008.

*Medium advancement*

#### Impact on road safety

**Type of impact:** *indirect.*

**Timing of the effects:** *long term.*

**Consistency with other measures:** the measure is linked with all the active safety actions aimed at helping drivers to avoid accidents.

#### Ex-post evaluation

##### Outcomes

Indeed, eSafety initiative and the projects carried out have to be considered as a step forward the adoption of information and communication systems for improving road safety. However, a proper regulatory framework for implementing the proposed measures has not been established yet.

**Effectiveness:** *high.*

Information and communication systems may have a remarkable impact in the field of road safety in the future.

**Efficiency:** *high.*

Total costs of the mentioned projects: 91,607,703 euro.

EC funding of the mentioned projects: 54,663,648 euro.

Despite the high costs for developing information and communication systems, it could be reasonably assumed that the potentially benefits largely overcome them.

**Sustainability:** *high.*

The Intelligent Car Initiative and the information gathered with the projects can contribute to the improvement of road safety for a long time.

## Results

**Description of the impact:** active safety systems could give a considerable positive contribution to road safety by decreasing the number of crashes.

**Contribution to road safety:** *high results.*

**What remains to be done (ERSAP 2011-2020):** this measure should be continued.

## Sources

eSafety website

eSafety Support website

Europe's Information Society Portal website

European Commission, COM (2008) 887, Final Proposal for a Directive of the European Parliament and of the Council laying down the framework for the deployment of Intelligent Transport Systems in the field of road transport and for interfaces with other transport modes, 16 December 2008

**Measure 38 Identify priority areas for the development and implementation of performance standards to optimise the man-machine interface and the road safety potential of telematics applications. Ensure compliance with the declaration of principles concerning the human-machine interface**

**Objective:** developing intelligent vehicles.

**Description**

With the advent of sophisticated technology (mobile and portable) and the increase in the amount of time spent on the road, the car has become a potential home to many different types of systems. Such systems range from those which convey simple information to the driver (for example incident warnings) to those that require the driver to interact with a system in order to extract the required function (for example a route guidance system).

The project HASTE (Human Machine Interface And the Safety of Traffic in Europe) had the goal of developing methodologies and guidelines for the assessment of In-Vehicle Information Systems (IVIS). There is an urgent need to develop thorough testing and diagnostic procedures for such systems in order to regulate their inclusion in the vehicle. If no such procedures are set up, the driving task may become of secondary importance to tasks relating to interaction with the system. If such distraction occurs, there is evidence that traffic safety will be compromised.

Another project to mention is EUCLIDE (Enhanced Human-Machine Interface for On-Vehicle Integrated Driving Support System) which aimed to developing an reliable integrated driver assistance support system.

EC funded also other projects for enhancing vehicle safety: the projects ROADSENSE, ADASE II, VEESA, AIDE, ATESST, EASIS, ASSET-ROAD, INTERACTION, ITERATE.

**Classification:** *projects.*

**State of implementation**

Duration of the HASTE project: from 1 January 2002 until 31 December 2004.

Duration of the EUCLIDE project: from 1 March 2001 until 31 May 2004.

The projects ASSET-ROAD, INTERACTION, ITERATE are expected to be completed in the years 2011-2012. The other mentioned projects were completed during the years 2001-2008.

*Medium advancement*

**Impact on road safety**

**Type of impact:** *indirect.*

**Timing of the effects:** *medium term.*

**Consistency with other measures:** this measure is consistent with all the actions aimed at assisting drivers in order to prevent accidents from occurring.

## Ex-post evaluation

### Outcomes

In general the projects carried out provided for useful results.

The project HASTE contributed to the development of a valid, reliable and efficient tool that will aid testing authorities in their safety evaluation of IVIS.

The project EUCLIDE developed a driving support system to monitor the area ahead of the driver and provide an effective support especially in cases of night and adverse weather conditions. This system integrates the functionalities of radar and far infrared sensors resulting into a highly reliable and efficient system.

**Effectiveness:** *high.*

A quantification of the impact is not feasible due to lack of data. Nevertheless the development of systems and tools supporting drivers is expected to be very effective in increasing road safety.

**Efficiency:** *medium.*

Total costs of the considered projects: 50,651,669 euro.

EC funding of the considered projects: 33,637,834 euro.

**Sustainability:** *medium.*

## Results

**Description of the impact:** the development of information systems for supporting drivers is expected to have a positive impact in decreasing the number of accidents and therefore to improve road safety.

**Contribution to road safety:** *medium results.*

**What remains to be done (ERSAP 2011-2020):** the measure needs to be continued.

## Sources

HASTE project (2005), Final Report, November 2005



### **Measure 39 Examine, together with the Member States, the need to include new onboard electronics systems in roadworthiness testing**

**Objective:** improving and maintaining the vehicle safety performance.

#### **Description**

Electronically controlling systems are being fitted in a growing numbers of vehicles. Vehicle safety (as well as environmental performance) is thus increasingly dependent on the correct functioning of these systems. Despite that, at present these systems are not part of the mandatory periodical technical inspection of vehicles. Also, there is little available data relating to the reliability of the electronic systems and to how they should be tested for correct function.

The research programme CITA1 (Research Study Programme on Electronically Controlled Systems on Vehicles) aimed at examining the performance of some current systems and at developing test procedures for the periodic inspections. It included a review of past, present and future electronic systems on vehicles.

The work of CITA1 was followed by the project IDELSY (Initiative for Diagnosis of Electronic Systems in Motor Vehicles), which aimed to develop test procedures and to test them in order to ensure their efficiency and effectiveness.

The general target of the project IDELSY was producing recommendations to improve the existing Regulation 96/96/EC for involving the new vehicle technology, which is more and more electronically controlled and relevant for the road safety.

The study has been carried out by seven technical inspection agencies, of three different countries.

The results of the research project IDELSY provided an important input for the project AUTOFORE (Study on the future Options for Roadworthiness Enforcement in the European Union) which aimed at analysing future strategies of road worthiness actions in Europe.

The specific purpose of AUTOFORE was making proposals and recommendations to improve roadworthiness enforcement, in order to ensure that the benefits accruing from the original design and manufacture of vehicles are retained throughout the life of those vehicles.

In 2007, the European Commission invited tenders for a service contract regarding the feasibility and impact assessment study on the future evolution of roadworthiness tests for motor vehicles, in order to evaluate a review of the Directive 96/96/EC. Unfortunately, this call for tender failed and had no follow-up.

Despite that, in May 2009, the Directive 2009/40/EC on roadworthiness tests for motor vehicles and their trailers repealing Directive 96/96/EC was approved. According to the new norm, the anti-lock braking systems have been included among the items to be compulsory tested. Instead, Electronic Stability Control systems (ESC) and airbags were not.

The need for roadworthiness enforcement is greater than ever because road safety (as well as environmental protection) is now more and more reliant on the correct functioning of the new electronic technologies, which are increasingly taking over aspects of the driver's tasks as a means of eliminating or mitigating the effects of human error. With this increased reliance on advanced technology, the role of vehicle roadworthiness needs to change.

**Classification:** *thematic study.*

### State of implementation

Duration of the project CITA1: from 5 July 1999 to 4 July 2002.

Duration of the project IDELSY: from 1 January 2004 to 1 December 2005.

Duration of the project AUTOFORE: from 1 February 2005 to 31 January 2007.

*Medium advancement*

### Impact on road safety

**Type of impact:** *indirect.*

**Timing of the effects:** *medium term.*

**Consistency with other measures:** this measure is tightly connected with Measure 40, which aims at determining and encouraging best practices to improve the efficiency of periodic compulsory inspections.

### Ex-post evaluation

#### Outcomes

According to the CITA1 Report (CITA1, 2001), even if electronic components tend to fail less frequently than mechanical components in the same system, the failure rate of certain systems is important enough to include them into the annual inspection regime.

The study concludes that vehicle electronic systems should be tested as part of the periodic inspection. In fact, it is important that all safety critical systems are tested regularly.

The final report (CITA1, 2002) presents a cost benefit analysis to assess the value of inspecting electronically controlled systems for roadworthiness.

Also the outputs of IDELSY's research provided support to improve the existing regulations for including the new generation of motor vehicles technologies: road safety is strongly influenced by modern vehicle systems, therefore the safe function of those systems should be part of the European PTI procedure.

The key result of the AUTOFORE study is a set proposals for the future direction of roadworthiness enforcement in the European Union.

**Effectiveness:** *not computable.*

There are no available data to quantify the impact of this measure on road safety.

**Efficiency:** *medium.*

CITA1 project cost: 600,000 euro.

CITA1 project EC funding: 300,000 euro.

IDELSY project cost: 896,700 euro.

IDELSY project EC funding: 448,350 euro.

AUTOFORE project cost: 600,000 euro.

AUTOFORE project EC funding: 300,000 euro.

The benefit-to-cost ratio of inspecting Electronic Stability Control (ESC) systems is 2.6 (AUTOFORE, 2007).

Additional benefits can arise from testing other systems, such as Anti-lock braking systems (ABS) and airbag systems.

**Sustainability:** *medium.*

The research will need a follow up.

## Results

**Description of the impact:** the growing sophistication of onboard electronic systems could lead to increasing problems with the reliability of these devices. According to available statistics (CITA1, 2001), it is quite rare that a failure of the electronic systems cause an injury accident. Anyway, it is clear that they have the potential to do so and when it happens consequences can be very severe. This is why there is a need for identifying systems that would potentially benefit from inclusion in periodic inspections.

**Contribution to road safety:** *low results.*

**What remains to be done (ERSAP 2011-2020):** given that the need to include new onboard electronic systems in roadworthiness testing has now reached a broad consensus, the coming ERSAP 2011-2020 should address the evaluation of possible modification of the existing legislative framework. In particular, the new Directive 2009/40/EC could be amended to include the compulsory testing of safety relevant electronic systems that are already widely fitted such as airbags and ESC. To this end, past research studies should be deepened.

## Sources

CITA, Periodical Inspection of Electronically Controlled Systems on Vehicles, final report 2002

CITA1, Project Report PR/SE/101/00, The reliability of electronically controlled systems on vehicles, 2001

IDELSY, Final Report, 31 December 2005

IDELSY, Management Summary, 19 April 2006

AUTOFORE, Study on the Future Options for Roadworthiness Enforcement in the European Union, final report, 2007

European Commission, Invitation to Tenders Nr. TREN/E3/353-2007, 28 August 2007

Directive 2009/40/EC of the European Parliament and of the Council on roadworthiness tests for motor vehicles and their trailers, 6 May 2009

Council Directive 96/96/EC on the approximation of the laws of the Member States relating to roadworthiness tests for motor vehicles and their trailers, 20 December 1996

## **Measure 40 Determine and encourage best practices so as to improve the efficiency of periodic compulsory inspections at the lowest cost**

**Objective:** improving and maintaining vehicle safety performance.

### **Description**

Making the periodic compulsory inspections more efficient is a theme addressed by several EC funded projects.

Within the framework of the project CITA1 (see Measure 39), a specific working group, the Working Group VII, was set up to study specifically the testing of electronically controlled systems, and to examine available reliability data and failure rates of electronically controlled systems. Possible test procedures have been proposed.

The research carried out within the project IDELSY (see Measure 39) examined the possible options for testing procedures for electronic systems in the periodic vehicle inspections, in order to increase the reliability and safety of such systems and therefore the safety of European road transports systems as a whole.

The general target of this project was to verify the technical feasibility for the use of generic scan tools within the periodic technical inspection for passenger vehicles and in future for commercial vehicles.

Finally, the project AUTOFORE (see also Measure 39) produced several proposals and recommendations to improve roadworthiness enforcement after reviewing the strategies and the potential for improvement of the current roadworthiness enforcement measures. The introduction of higher roadworthiness standards was proposed.

The legislative framework for roadworthiness testing has been recently amended with the Directive 2009/40/EC (published in the Official Journal on the 6<sup>th</sup> of June 2009), which replaces the current roadworthiness Directive 96/96/EC. The new Directive includes periodic inspection requirements for CO2 emissions, including testing frequency.

**Classification:** *best practice.*

### **State of implementation**

*Medium advancement*

### **Impact on road safety**

**Type of impact:** *indirect.*

**Timing of the effects:** *medium term.*

**Consistency with other measures:** this measure is tightly connected with Measure 39, which aims at examining the opportunity of including the new vehicle electronic system in the roadworthiness testing.

### **Ex-post evaluation**

### **Outcomes**

The project CITA1 (CITA1, 2001) provided the basis for the development of test procedures for the electronically controlled systems. This enables research efforts to be prioritised for those systems which appear to be less reliable and provides a benchmark for measuring the effectiveness of periodic test procedures and inspections.

The project IDELSY examined different possible test procedures, with the aim of improving and optimising them. It also carried out field trials to corroborate the results of the research. Scan tools and test procedures to be used in the course of periodic vehicle inspections have been developed and the functionality and safety of electronic control units have been verified.

The options for improving roadworthiness enforcement identified and analysed by AUTOFORE are:

1. Improve roadworthiness Directives.
2. Improve type approval requirements and legislative process.
3. Develop the infrastructure required to inspect electronically controlled systems.
4. Promote improved compliance.
5. Develop supporting roadworthiness inspection databases and related items.
6. Improve linkages between forms of roadworthiness enforcement.
7. Support research and development.

The objective, according to the research group, would be to implement them by 2020.

**Effectiveness:** *medium*.

The results achieved so far by the research on best practices need to find a wider application.

**Efficiency:** *medium*.

One of the recommendation resulting from the AUTOFORE research is increasing the frequency of inspection for older light goods vehicles and for small passengers vehicles (up to eight seats, excluding the driver). The economic benefit of increased frequency of inspection of older light vehicles would be over 2 billion euro if vehicles of 8 years and over are inspected annually with a benefit-to-cost ratio larger than 2 (AUTOFORE, 2007).

CITA1 project cost: 600,000 euro.

CITA1 project EC funding: 300,000 euro.

IDEFSY project cost: 896,700 euro.

IDEFSY project EC funding: 448,350 euro.

AUTOFORE project cost: 600,000 euro.

AUTOFORE project EC funding: 300,000 euro.

**Sustainability:** *high*.

The study and exchange of best practices is expected to impact on policy making in the medium and long term.

## Results

**Description of the impact:** improving the efficiency of periodic compulsory inspections helps maintaining the safety performance of motor vehicles in the best conditions, minimising the risk of accidents due to vehicle malfunctioning.

**Contribution to road safety:** *medium results.*

**What remains to be done (ERSAP 2011-2020):** amendments to the current legislative framework should be studied and evaluated in order to:

- increase the frequency of inspection for older vehicles of categories 5 and 6, as defined in the Directive 2009/40/EC (Annex I);
- include two-wheeled motor vehicles (international categories L1 and L3) in the scope of the legislation;
- introduce test procedures for new electronic components with a view to improve the roadworthiness of vehicles.

A regulatory impact statement should be carried out in these regards.

Moreover, new thematic studies should be initiated to deepen past studies and to further research, in particular:

- the magnitude of the contribution of vehicle defects to accidents and to trial new inspection systems suitable for inspecting the functionality of electronically based technologies;
- methods of improving compliance, effectiveness and efficiency of vehicle inspection.

Finally, further work should be undertaken to develop proposals for increasing harmonisation of European roadworthiness standards.

## Sources

CITA, Periodical Inspection of Electronically Controlled Systems on Vehicles, final report 2002

IDELSY, final report, 2005

CITA1, Project Report PR/SE/101/00, The reliability of electronically controlled systems on vehicles, 2001

AUTOFORE, Study on the Future Options for Roadworthiness Enforcement in the European Union, final report, 2007

Directive 2009/40/EC of the European Parliament and of the Council on roadworthiness tests for motor vehicles and their trailers, 6 May 2009

Council Directive 96/96/EC on the approximation of the laws of the Member States relating to roadworthiness tests for motor vehicles and their trailers, 20 December 1996





## **INFRASTRUCTURE**

- Measure 41: Submit a proposal for a framework directive on road infrastructure safety with a view to introducing a system for the harmonised management of black spots and road safety audits for roads on the trans-European network
- Measure 42: Draw up technical guidelines concerning infrastructure, notably for low cost measures, audit methods, urban safety management, speed moderation techniques and forgiving roadsides
- Measure 43: Draw up good practice guidelines for level-crossing safety
- Measure 44: Assess the safety impact of projects receiving Community funding and concerning an entire area
- Measure 45: Adapt to technical progress the Community standards applicable to road equipment and ensure a high level of protection, notably by making road sides less hazardous in the event of an accident
- Measure 46: Carry out research and demonstration projects on ‘intelligent roads’
- Measure 47: Achieve a high level of safety in tunnels, notably through standards and user information

**Measure 41 Submit a proposal for a framework directive on road infrastructure safety with a view to introducing a system for the harmonised management of black spots and road safety audits for roads on the trans-European network**

**Objective:** improving the safety of road infrastructures within the trans-European road network.

**Description**

In 2008, the European Parliament and the Council of the European Union emanated a directive (Directive 2008/96/EC) in order to establish procedures to ensure a consistently high level of road safety throughout the trans-European road network.

**Classification:** *EU norm.*

**State of implementation**

The Directive 2008/96/EC was emanated on 19 November 2008 with effect by 19 December 2010.

*Completed*

**Impact on road safety**

**Type of impact:** *indirect.*

**Timing of the effects:** *medium term.*

**Consistency with other measures:** the measure is consistent with the general scope of increasing road safety through a proper management of the infrastructures. Therefore this measure is closely linked with all the actions relating to road infrastructure safety management (see Measure 5 and 44)

**Ex-post evaluation**

**Outcomes**

The Directive 2008/96/EC requires the establishment and implementation of procedures relating to road safety impact assessments, road safety audits, the management of road network safety and safety inspections by the Member States. It shall apply to roads which are part of the trans-European road network, whether they are at the design stage, under construction or in operation.

**Effectiveness:** *high.*

Even if it is not possible to quantify the impact of the measure, it is reasonable to assume an high effectiveness of the Directive 2008/96/EC in increasing road safety.

**Efficiency:** *medium.*

The benefits deriving from a better safety management of the trans-European network are expected to overcome the costs, even if the latter may be elevated.

**Sustainability:** *high.*

The effects of the implementation of the Directive 2008/96/EC are expected to last in the long term.

## Results

**Description of the impact:** to date, considering the timing and the features of the described directive, it is early to assess the impact of such measure. However it can reasonably be considered a promising measure for improving road safety

**Contribution to road safety:** *high results.*

**What remains to be done (ERSAP 2011-2020):** monitoring the implementation in Member States of the Directive 2008/96/EC. It should be evaluated a possible application of this measure to other roads network (rural and urban roads).

## Sources

Directive 2008/96/EC of the European Parliament and of the Council on Road Infrastructure Safety Management, 19 November 2008

**Measure 42 Draw up technical guidelines concerning infrastructure, notably for low cost measures, audit methods, urban safety management, speed moderation techniques and forgiving roadsides**

**Objective:** improving road safety through the management of road infrastructures.

**Description**

Road infrastructure related safety measures offer a large potential that could be exploited for a significant reduction of road accidents and their consequences.

Considering that most casualties occur on single carriageway rural roads, the project RIPCORD-ISEREST was focused on road infrastructure measures for this type of roads. Researchers and practitioners in the Member States of the European Union have made great efforts to improve traffic safety. Many of these approaches have already led to a significant reduction in fatalities. The objective of this project was to collect and to evaluate these approaches in order to make them accessible throughout Europe and to develop tools, which could be used to improve traffic safety. With these tools RIPCORD-ISEREST intended to give scientific support to practitioners concerned with road design and traffic safety in Europe.

The project SUPREME, commissioned by DG TREN of the European Commission, had the goal to collect, analyse, summarise and publish best practices in road safety in the Member States of the European Union, as well as in Switzerland and Norway. In particular a document was produced containing a collection of best practices at national scale and aiming to present the project's results to national/regional policy and decision makers across Europe, thereby encouraging the adoption of successful road safety strategies and measures.

It's also noteworthy to mention ROSEBUD, a thematic network funded by the European Commission to support users at all levels of government (European Union, national, regional, local) with road safety related efficiency assessment solutions for the widest possible range of measures. ROSEBUD will bring together e.g. users, researchers, decision makers, policy makers and other relevant stakeholders around efficiency assessment of road safety measures. It was designed to facilitate networking of organisations, co-ordination of activities, exchange and dissemination of knowledge.

Other projects to be mentioned are NR2C (New Road Construction Concept), EURO-AUDITS (European Road Safety Auditor Training Syllabus), EURORAP I and II (European Roads Assessment Programme), IASP (Identification of Hazard Location and Ranking of Measures to Improve Safety), RISER (Roadside Infrastructure for Safer European Roads), RANKERS (Ranking for European Road Safety), EURAMP (European Ramp Metering Project), FORMAT (Fully optimised road maintenance), SAMARIS (Sustainable and advanced materials for road infrastructures), SENSOR (Secondary road network traffic management strategies) and SILVIA (Sustainable road surfaces for traffic noise control)..

**Classification:** *thematic projects.*

**State of implementation**

Duration of the SUPREME project: from 1 December 2005 to 1 June 2007.

Duration of the ROSEBUD project: from 1 October 2002 until 1 September 2005.

Duration of the RIPCORDER-ISEREST project: from 1 January 2005 until 31 December 2007

The other mentioned projects were completed between years 2002 and 2008.

*Medium advancement*

### Impact on road safety

**Type of impact:** *indirect.*

**Timing of the effects:** *long term.*

**Consistency with other measures:** this measure is linked with Measure 45, aimed at improving the equipment of the road infrastructures.

### Ex-post evaluation

#### Outcomes

The main outcomes of RIPCORDER-ISEREST can be summarised as follows:

- The development of best practice tools and guidelines for road infrastructure safety measures concerning accident prediction models, road safety inspections, and black-spot management;
- The development of tools for cost efficiency assessment of different safety measures;
- The development, with regard to secondary roads, of specific software tools and a handbook for local road authorities.

The final report of SUPREME project consists of 14 parts, among which handbooks of best practices in road safety for measures at the country and European level and a thematic report regarding road infrastructures.

Regarding ROSEBUD, the results of this structured approach towards improving the process of decision making about road safety measures are document in five scientific reports. Conclusions and recommendations are summarised in three publications, which are considered the main output of ROSEBUD:

- A handbook of evaluated road safety measures
- A framework of best practices for conducting efficiency assessment studies
- A “demonstration course” to make decision makers familiar with the proposed efficiency assessment tools.

The other considered projects provided for useful indications and recommendations too.

**Effectiveness:** *high.*

There are no available data to quantify the effects of this measure. However the implementation of safety measures related to road infrastructures is likely to have a remarkable impact on road safety.

**Efficiency:** *medium.*

Total costs of the considered projects (project SUPREME excluded): 23,135,557 euro.

EC funding of the considered projects (project SUPREME excluded): 14,397,936 euro.

The benefits deriving from a better safety management of the road infrastructure are expected to overcome the costs, even if the latter may be elevated.

**Sustainability:** *medium.*

The outputs achieved in the framework of this measure will support infrastructure management at European, national and local level.

## Results

**Description of the impact:** the introduction of technical guidelines for road infrastructures could allow a safer circulation of the vehicles resulting in both less crashes and less dangerous consequences for road users in the event of an accident.

**Contribution to road safety:** *medium results.*

**What remains to be done (ERSAP 2011-2020):** the guidelines have been developed, but their implementation has yet to come. Action needs to be taken at national level.

## Sources

ROSEBUD website

DG TREN website

SUPREME project (2007), Handbook for Measures at the Country Level, 17 June 2007

SUPREME project (2007), Handbook for Measures at the European Level, 17 June 2007

SUPREME project (2007), Thematic Report, Infrastructure, 17 June 2007

## **Measure 43 Draw up good practice guidelines for level-crossing safety**

**Objective:** improving road safety through the management of road infrastructures.

### **Description**

Every year, more than 330 people are killed in more than 1200 accidents at road-rail level crossings in the European Union. Together with tunnels and specific road black spots, level crossings have been identified as being a particular weak point in road infrastructure, seriously affecting road safety.

The High Level Group on Road Safety from European Commission DG Energy and Transport decided in 1999 to set up a working group on safety at rail-road level crossings. Apart from informing the Commission on the current state of practice as well as state of the art, the group was also meant to produce advice and foster the exchange of information between Member States in its domain of work.

The group finalised a first report in March 2000. It contained a typology of level crossings, which is an important prerequisite for risk analysis and development of a remedial programme, traffic rules and signing and signalling (optical and acoustical). A second report of the group was finalised in December 2003. Such report was addressed to the European, the national and the regional legislators and executives in ministries, road institutes, road authorities and academia.

In addition, the project SELCAT (Safer European Level Crossing Appraisal and Technology), a coordination action of the European Commission's 6th Framework Programme involving partners from European countries as well as from Asia and Africa, was launched on 1 September 2006. Its main objective was to collect and disseminate knowledge related to level crossing risk appraisal, technology and methodology.

**Classification:** *thematic study.*

### **State of implementation**

The report from expert group was finalised in 2003, but there was not a follow-up.

Duration of the SELCAT project: from September 2006 to September 2008.

*Low advancement*

### **Impact on road safety**

**Type of impact:** *indirect.*

**Timing of the effects:** *long term.*

**Consistency with other measures:** this measure is consistent with the general scope of improving the safety of road infrastructures.

### **Ex-post evaluation**

#### **Outcomes**

In the 2nd Report of the Working Group on Level Crossings a set of conclusions and recommendations regarding the level-crossing safety was drawn. The report could serve as input to strategic road safety planning, the implementation of measures, the adoption of guidelines and their implementation. At the same time, the level of detail of this report is not sufficient to function as a guideline for direct use by practitioners.

SELCAT project provided useful recommendations about the appraisal, technologies and methodologies regarding level crossing as well as campaigns for road vehicle drivers.

**Effectiveness:** *medium.*

The exchange of best practices at European level may effectively support improvements and enhancements in the actions taken in the field of level crossing safety, but they could be further developed.

**Efficiency:** *medium.*

It may be reasonably assumed that the potential benefits overcome the costs of the research.

**Sustainability:** *medium.*

If taken in account by Member States, the effects on road safety of the indications and recommendations provided by the research could potentially last in the long term.

## Results

**Description of the impact:** developing guidelines for rail-road level crossings safety could reduce dangerous situations for road users, therefore increasing road safety.

**Contribution to road safety:** *medium results.*

**What remains to be done (ERSAP 2011-2020):** studies should be continued, improving the monitoring of such accidents and finding solutions in collaboration with the rail operators and a possible revision of road signs (UN-ECE).

## Sources

European Commission, DG Energy and Transport, Safety at Level Crossings, 2nd Report of the Working Group on Level Crossings, 19 December 2003

SELCAT project (2008), Final Report for Publication, September 2008



## **Measure 44 Assess the safety impact of projects receiving Community funding and concerning an entire area**

**Objective:** taking into consideration the safety impact of the European projects.

### **Description**

The setting up of appropriate assessment procedures is an essential tool for improving the safety of road infrastructure. The safety impact assessments aims at illustrating, on a strategic level, the implications on road safety of different planning alternatives of a project, playing an important role when those are being selected.

The Directive 2008/96/EC on Road Infrastructure Safety Management requires the establishment and implementation of procedures relating to road safety impact assessments, road safety audits, the management of road network safety and safety inspections by the Member States.

The specific objective of this Directive is to ensure a consistently high level of road safety throughout the trans-European road network.

Member States may also apply the provisions of this Directive to national road transport infrastructure constructed using Community funding in whole or in part, but not included in the trans-European road network. Anyway, this is not a requirement, but only an opportunity.

The Annex II of the Directive 2008/96/EC on Road Infrastructure Safety Management defines the criteria to be met by Member States when carrying out a road safety impact assessment (article 3.2).

Road tunnels are excluded from the scope of the Directive and are covered by Directive 2004/54/EC (see Measure 47.)

**Classification:** *monitoring and evaluation.*

### **State of implementation**

This objective has seen only a partial realisation.

Action has been taken only for what concerns the infrastructures safety management of the trans-European road network. The Directive 2008/96 will be also applied in the implementation of the European Investment Bank (EIB) and the FEDER (European regional development fund) projects. while the application of safety impact assessment to other Community funded projects remains optional. The DG REGIO has still not taken into account the requirements of the Directive.

Member States shall bring into force the legislation necessary to comply with this Directive by 19 December 2010.

By 19 December 2011, Member States should adopt the guidelines for applying the safety procedures set out in the Directive.

*Low advancement*

## Impact on road safety

**Type of impact:** *indirect.*

**Timing of the effects:** *medium and long term.*

**Consistency with other measures:** this measure is closely linked with all the actions relating to road infrastructure safety management. In particular, it is linked with the aim of Measure 5 relating to harmonised road safety criteria in public service contracts.

## Ex-post evaluation

### Outcomes

The Directive 2008/96 still need to be applied in the Member States.

**Effectiveness:** *not computable.*

**Efficiency:** *not computable.*

**Sustainability:** *low.*

## Results

**Description of the impact:** road infrastructure safety management contributes to take into account the impact on road safety in project definition, planning and implementation, allowing an increase in safety awareness by the part of the decision-makers and in safety performance of the infrastructure.

**Contribution to road safety:** *medium results.*

**What remains to be done (ERSAP 2011-2020):** beyond the mandatory implementation of the procedure to the TEN-network (Directive 2008/96), the requirement of an appropriate assessment procedures should be extended to all the projects funded by the European Union.

## Sources

Directive 2008/96/EC of the European Parliament and of the Council on Road Infrastructure Safety Management, 19 November 2008, OJ 319/59 of the 29 11 2008

**Measure 45 Adapt to technical progress the Community standards applicable to road equipment and ensure a high level of protection, notably by making road sides less hazardous in the event of an accident**

**Objective:** increasing road safety by improving the equipment of the road infrastructures.

**Description**

In November 2008 the project Smart RRS started with the objective of reducing the number of injuries and deaths caused by road traffic accidents to vulnerable road users such as motorcyclists, cyclists and passengers through the development of a smart road restraint system.

**Classification:** *thematic study.*

**State of implementation**

Project Smart RRS started the 3 November 2008 and it is expected to be completed by 31 October 2011.

*Low advancement*

**Impact on road safety**

**Type of impact:** *indirect.*

**Timing of the effects:** *long term.*

**Consistency with other measures:** this measure is linked with all the actions aiming at making safer the circulation of vehicles on the road infrastructures. In particular, it is consistent with Measure 42 regarding the development of technical guidelines for improving the safety of road infrastructures.

**Ex-post evaluation**

**Outcomes**

The project Smart RRS will develop a new smart road restraint system that will reduce the number of deaths and injuries caused in road traffic accidents by integrating primary and tertiary sensor systems in a new RRS system; providing greater protection to all road users, alerting motorists and emergency services of danger so as to prevent accidents happening, and alerting them of accidents as they happen to maximise response time to the exact location of the incident.

**Effectiveness:** *high.*

Developing smart road restraint systems is expected to have a high impact on road safety, especially on the safety of vulnerable road users such as motorcyclists, cyclists and passengers.

**Efficiency:** *medium.*

Smart RRS project cost: 3,420,000 euro.

Smart RRS project EC funding: 2,193,000 euro

Even if a quantitative assessment of the costs is not feasible, it can be reasonably assumed that benefits overcome the costs.

**Sustainability:** *high.*

The effects of the measure could potentially last in the long term.

## Results

**Description of the impact:** making the equipment of road infrastructures less dangerous for users could reduce the number of serious injuries and fatalities.

**Contribution to road safety:** *high results.*

**What remains to be done (ERSAP 2011-2020):** this measure should be continued, since it has a high potential in increasing road safety.

## Sources

Smart RRS website

World Health Organisation (WHO) (2004), World Report on Road Traffic Injury Prevention, 2004

European Transport Safety Council (ETSC) (2000), Report on European Road Transport Safety, 2000

## **Measure 46 Carry out research and demonstration projects on ‘intelligent roads’**

**Objective:** increasing road safety through the development of “intelligent roads”.

### **Description**

By using new approaches in order to add intelligence to road infrastructures, it could be possible to reduce the number of road accidents as well as the infrastructures maintenance costs (which are constantly increasing in Europe) and optimise the capacity of existing infrastructures.

During the years projects on “intelligent roads” have been carried out: some of these have been completed, while some are still in progress. In particular it’s worth to mention the following projects:

- INTRO (Intelligent Roads);
- CVIS (Co-operative vehicle-infrastructure systems);
- SAFESPOT (Cooperative systems for road safety “Smart Vehicles on Smart Roads”);
- INTERSAFE 2 (Cooperative Intersection Safety);
- IN SAFETY (Infrastructure and safety);
- MISS (Monitor Integrated Safety Systems);
- REACT (Realising Enhanced Safety and Efficiency in European Road Transport);
- COM2REACT (Cooperative communication system to realise enhanced safety and efficiency in European road transport);
- COMeSafety (Communications for eSafety);
- COOPERS (Co-operative Systems for Intelligent Road Safety);
- COVER (Semantic driven cooperative vehicle infrastructure systems for advanced eSafety applications);
- TRACKSS (Technologies for Road Advanced Cooperative Knowledge Sharing Sensors).

**Classification:** *projects.*

### **State of implementation**

Duration of the INTRO project: from 1 March 2005 until 29 February 2008.

Duration of the CVIS project: from 1 March 2006 until 31 January 2010.

Duration of the SAFESPOT project: from 1 February 2006 until 31 January 2010.

Duration of the INTERSAFE 2 project: from 1 January 2008 until 31 December 2010.

Duration of the IN SAFETY project: from 1 January 2005 until 31 December 2007.

Duration of the MISS project: from 1 January 2005 until 31 December 2006.

Duration of the REACT project: from 1 January 2005 until 31 December 2006.

Duration of the COM2REACT project: from 1 January 2006 until 31 December 2007.

Duration of the COMeSafety project: from 1 January 2006 until 31 December 2009.

Duration of the COOPERS project: from 1 February 2006 until 31 January 2010.

Duration of the COVER project: from 1 March 2006 until 28 February 2008.

Duration of the TRACKSS project: from 1 January 2006 until 31 December 2008.

*Medium advancement*

### Impact on road safety

**Type of impact:** *indirect.*

**Timing of the effects:** *long term.*

**Consistency with other measures:** The development of “intelligent roads” are closely connected with active safety actions such as the ones considered in the Measures 37 and 38.

### Ex-post evaluation

#### Outcomes

The number and contents of the mentioned projects provide large and various indications, measures and approaches for the development of intelligent roads infrastructures.

**Effectiveness:** *high.*

The results of the different projects are likely to give a remarkable contribute to the development of “intelligent roads” offering an innovative approach for road safety improvement.

**Efficiency:** *medium.*

The deployment of intelligent infrastructure is expected to be highly costly, but it can also produce important positive effects.

INTRO project cost: 3,496,456 euro.

INTRO project EC funding: 1,999,020 euro.

CVIS project cost: 41,170,000 euro.

CVIS project EC funding: 21,910,000 euro.

SAFESPOT project cost: 37,630,000 euro.

SAFESPOT project EC funding: 20,590,000 euro.

INTERSAFE 2 project cost: 6,500,000 euro.

INTERSAFE 2 project EC funding: 3,860,000 euro.

IN SAFETY project cost: 5,570,000 euro.

IN SAFETY project EC funding: 2,940,000 euro.

MISS project cost: 2,989,046 euro.

MISS project EC funding: 1,499,977 euro.

REACT project cost: 3,675,513 euro.

REACT project EC funding: 1,999,955 euro.

COM2REACT project cost: 5,590,000 euro.

COM2REACT project EC funding: 3,000,000 euro.

COMeSafety project cost: 1,550,000 euro.

COMeSafety project EC funding: 1,100,000 euro.

COOPERS project cost: 16,780,000 euro.

COOPERS project EC funding: 9,800,000 euro.

COVER project cost: 4,140,000 euro.

COVER project EC funding: 2,240,000 euro.

TRACKSS project cost: 4,370,000 euro.

TRACKSS project EC funding: 2,500,000 euro.

**Sustainability:** *high.*

The development of “intelligent roads” is expected to have a durable impact on road safety.

## Results

**Description of the impact:** developing intelligent roads could have a high impact in reducing the number of accidents. The positive results could be even more considerable if the synergies with the active safety domain are exploited.

**Contribution to road safety:** *high results.*

**What remains to be done (ERSAP 2011-2020):** studies should be deepened.

## Sources

World Health Organisation (WHO) (2004), World Report on Road Traffic Injury Prevention, 2004

European Transport Safety Council (ETSC) (2000), Report on European Road Transport Safety, 2000





## **Measure 47 Achieve a high level of safety in tunnels, notably through standards and user information**

**Objective:** improving road infrastructures safety.

### **Description**

The European Council has on several occasions, and notably at its meeting on 14 and 15 December 2001 in Laeken, underlined the urgency of taking measures to improve tunnel safety. On 30 November 2001, the Transport Ministers of Austria, France, Germany, Italy and Switzerland met in Zurich and adopted a Common Declaration recommending the alignment of national legislations on the most recent harmonised requirements for improving safety in long tunnels.

In April 2004 the European Parliament and the Council of the European Union emanated the Directive 2004/54/EC with the aim to ensuring a minimum level of safety for road users in tunnels in the Trans-European Road Network by the prevention of critical events that may endanger human life, the environment and tunnel installations, as well as by the provision of protection in case of accidents.

The directive applied to all tunnels in the Trans-European Road Network with lengths of over 500 m, whether they are in operation, under construction or at the design stage.

In addition projects regarding tunnels safety have been carried out. In the framework of the project EUROTAP (European Tunnels Assessment Programme) tunnels located on the Trans-European Road Network have been assessed for their level of road safety.

It's worth to mention other projects such as the project UPTUN (cost-effective, sustainable and innovative upgrading methods for fire safety in existing tunnels), the project Safe Tunnel (innovative systems and frameworks for enhancing of traffic safety in road tunnels), the project Safe-T (Safety in Tunnels Thematic Network) and project SIRTAKI (Safety Improvement in Road & rail Tunnels using Advanced ICT and Knowledge Intensive DSS).

**Classification:** *projects/EU norms.*

### **State of implementation**

The Directive 2004/54/EC was emanated on 29 April 2004 with transposition for Member States by 30 April 2006, while project EUROTAP started on 1 January 2005. The other mentioned projects were carried out in the years from 2001 and 2006.

*High advancement*

### **Impact on road safety**

**Type of impact:** *indirect.*

**Timing of the effects:** *medium term.*

**Consistency with other measures:** increasing the safety in tunnels is consistent with the general aim of improving the road infrastructures safety management.

## Ex-post evaluation

### Outcomes

The Directive 2004/54/EC provided for a set of safety measure as well as procedures for the management of tunnels.

Regarding project EUROTAP, the results of the tunnels tested are published every year in media all across Europe. Tunnels users are able to access via the internet safety relevant information about individual tunnels in seven different languages. A European Tunnel Audit Report was produced covering nine years of tunnel tests highlighting what has been achieved and what still needs to be done. Information leaflets were targeted at motorists giving information on how to behave correctly in tunnels.

**Effectiveness:** *high*.

Numerous European road tunnels have been refurbished and modernised following the requirements of the Directive 2004/54/EC.

**Efficiency:** *high*.

A quantification of the impact of the measure is not possible due to the lack of data. Nevertheless, considering the findings of the carried out projects (in particular the project EUROTAP) and of the Directive 2004/54/EC, it could be reasonably assumed that benefits largely overcome costs.

**Sustainability:** *high*.

The effects of the implementation of the Directive 2004/54/EC and the project EUROTAP are expected to last in the long period.

## Results

**Description of the impact:** a better management of tunnels and a proper road users information in order to improve their behaviour contribute to reduce the accidents, therefore increasing road safety.

**Contribution to road safety:** *high results*.

**What remains to be done (ERSAP 2011-2020):** monitoring the implementation of Directive 2004/54. Stimulating the exchange of best practices among Member States and tunnel operators, in particular with respect to the newly created "safety officer" activity. It should be considered a possible application of such actions not only to the Trans-European Road Network, but also to other roads.

## Sources

Directive 2004/54/EC of the European Parliament and of the Council on minimum safety requirements for tunnels in the Trans-European Road Network, 29 April 2004

EUROTAP website

## **PROFESSIONAL DRIVERS**

- Measure 48: Adoption and incorporation in national legislation of a European Parliament and Council directive on the training of commercial drivers
- Measure 49: Tighter legislation (and enforcement) of driving and rest periods for commercial road haulage
- Measure 50: Installation of digital tachographs in commercial vehicles
- Measure 51: Best practice guidelines concerning company policies
- Measure 52: Best practice guidelines concerning the securing of loads and the carriage of exceptional loads
- Measure 53: Adapting to technical progress the Community legislation concerning the carriage of hazardous goods
- Measure 54: Making the wearing of seatbelts mandatory in coaches and heavy goods vehicles
- Measure 55: Introducing protection rules for vehicles regularly used for the carriage of children
- Measure 56: Examining the impact on road safety of the growing use of small commercial vehicles and company vehicles

## **Measure 48 Adoption and incorporation in national legislation of a European Parliament and Council directive on the training of commercial drivers**

**Objective:** improving road safety through the training of commercial drivers.

### **Description**

The EU has encouraged its members to provide better training for professional drivers. Many professional drivers in the EU are working without the benefit of training or the opportunity to regularly refresh their skills. In 2003 EU introduced the Directive 2003/59/EC whose overall aim was to promote the professional competence of the drivers, with positive implications in terms of: increased road safety; reduced emissions and fuel consumption; enhanced profile of the industry; and harmonised training of drivers which may ease worker mobility in the EU market. Moreover, the directive also lowered the minimum age for driving a truck to 18 years in order to ease the problem of shortage of drivers in Europe.

**Classification:** *EU norm.*

### **State of implementation**

The Directive 2003/59/EC was emanated on 15 July 2003 with effect from 10 September 2008.

*Completed*

### **Impact on road safety**

**Type of impact:** *indirect.*

**Timing of the effects:** *medium term.*

**Consistency with other measures:** this measure is consistent with the general scope of improving the behaviour of the professional drivers.

### **Ex-post evaluation**

#### **Outcomes**

The Directive 2003/59/EC made it compulsory for European member states to have Driver Certificate of Professional Competence (CPC) across the EU for all professional bus and truck drivers. The introduction of Driver CPC required more rigorous testing and continuous training for professional bus drivers from 10th September 2008 and truck drivers from 10th September 2009.

According to the provisions of the Directive, two types of CPCs have been foreseen:

- the CPC certifying initial qualification, which is issued to drivers that apply for the first time for a CPC. It is required that drivers need to successfully pass an official practical and theoretical test organised under the supervision of the Member State of their residence. Each Member State can also decide to render mandatory a previous training;

- the CPC certifying periodic training, which is issued to drivers that already hold a CPC certifying initial qualification or are exempted from the requirement to obtain it, after completion of a periodic training on road safety and rationalised fuel consumption. The first of the periodic trainings must be completed within five years (in some cases, Member States were allowed to shorten this period to three years or extend it to seven) after the CPC certifying initial qualification has been issued (or five years after 10th September 2009 for the drivers exempted from the obligation to certify initial qualification). A periodic training must then be completed every five years.

As an exception to the general rule, young drivers can work for a maximum period of three years without holding a CPC, under the condition that they are involved in a national vocational training lasting at least six months.

**Effectiveness:** *medium.*

**Efficiency:** *medium.*

To date it is early to assess the impact of this measure. However, considering the features of the described directive, it's reasonable to assume a good results in terms of both effectiveness and efficiency.

**Sustainability:** *high.*

The effects of the implementation of the Directive 2003/59/EC are expected to last in the long term.

## Results

**Description of the impact:** improving driving skills of the professional drivers could increase not only their safety, but the one of all road users.

**Contribution to road safety:** *medium results.*

**What remains to be done (ERSAP 2011-2020):** monitoring the implementation at national level of the Directive 2003/59/EC. Stimulating the exchange of best practices.

## Sources

Directive 2003/59/EC of the European Parliament and of the Council on the initial qualification and periodic training of drivers of certain road vehicles for the carriage of goods or passengers, amending Council Regulation (EEC) No 3820/85 and Council Directive 91/439/EEC and repealing Council Directive 76/914/EEC, 15 July 2003

## **Measure 49 Tighter legislation (and enforcement) of driving and rest periods for commercial road haulage**

**Objective:** increasing road safety by improving drivers' working conditions for the commercial road haulage.

### **Description**

On 15th July 1997 the European Commission adopted a White Paper on sectors and activities excluded from the working time directive [COM(97) 334 final], in which it proposed several approaches designed to protect the health and safety of workers in the sectors excluded from the basic Directive.

Following consultations with the social partners, the Commission concluded, in its Communication of 31 March 1998 [SEC(1998) 537 final] that nothing justified treating “mobile” workers and “non-mobile workers” in a different way and that therefore the basic principles of the working time directive should apply to all workers.

Regarding the organisation of working time of persons performing mobile road transport activities, the European Parliament and of the Council of the European Union emanated the Directive 2002/15/EC of 11 March 2002. Such a directive was a *lex specialis* to the general Working Time Directive 2003/88/EC and supplements Regulation (EC) No 561/2006 of 15 March 2006 laying down common rules on driving times and rest periods for drivers. The main objective the Directive 2002/15/EC was the introduction of minimum standards to protect the health and safety of road workers, avoid distortions to competition within the Community and improve road safety.

In 2008 the proposal of directive COM (2008) 650 was carried out by EC in order to amend the Directive 2002/15.

**Classification:** *EU norm.*

### **State of implementation**

The Directive 2002/15/EC was emanated on 11 March 2002 and it has come into force since March 2005.

The proposal COM (2008) 650 was emanated on 15 October 2008.

*Medium advancement*

### **Impact on road safety**

**Type of impact:** *indirect.*

**Timing of the effects:** *short term.*

**Consistency with other measures:** this measure is consistent with the actions aimed at improving the working conditions of professional drivers.

### **Ex-post evaluation**

#### **Outcomes**

The Directive 2002/15/EC provided for common rules that ensure minimum social protection standards for mobile workers in the road transport sector and are perceived as an important step towards improving the health and safety protection of mobile workers in the sector, enhancing road safety and ensuring fair competition.

The proposal for a directive amending Directive 2002/15/EC has the objective to enhance clarity, readability and enforceability of the current rules by providing a more precise definition of mobile workers including so called “false” self-employed drivers under this category of workers and therefore subject to the directive.

**Effectiveness:** *medium.*

Even if a quantification of the impact of this measure on driver fatigue is not feasible, a positive effect on road safety can be reasonably assumed.

**Efficiency:** *low.*

The new legislation of driving and rest periods for commercial road haulage is going to increase the costs of both the haulage sector and the enforcement bodies.

**Sustainability:** *medium.*

In order to apply the legislative framework on drivers’ working conditions and to have a durable impact on road safety, enforcement and controls need to be assured.

## Results

**Description of the impact:** mandating rest periods for professional hauliers reduce the risks of impaired driving due to fatigue.

**Contribution to road safety:** *high results.*

**What remains to be done (ERSAP 2011-2020):** this measure should be continued.

## Sources

European Commission, Directive 2002/15/EC on the organisation of the working time of persons performing mobile road transport activities, 11 March 2002

European Commission, COM (2008) 650, Final Proposal for a Directive of the European Parliament and of the Council amending Directive 2002/15/EC on the organisation of the working time of persons performing mobile road transport activities, 15 October 2008

## **Measure 50 Installation of digital tachographs in commercial vehicles**

**Objective:** increasing road safety by monitoring the details of the driver's behaviour and of the journeys.

### **Description**

Road safety would be improved by the automatic recording and regular monitoring, both by the undertaking and by the competent authorities, of details of the driver's performance and behaviour and of the vehicle's journey, such as speed and distance covered. EU legislation on road transport paid attention to this issue in the years.

The first norm was the Council Regulation (EEC) No 3821/85 of 20 December 1985 on recording equipment in road transport.

The Council Regulation (EC) No 2135/98 of 24 September 1998 amended and Directive 88/599/EEC concerning the application of Regulations (EEC) No 3820/84 and (EEC) No 3821/85. Such a Regulation is of paramount relevance since it has introduced the digital tachograph and tightened the minimum controls.

Regulation (EC) No 561/2006 of the European Parliament and of the Council of 15 March 2006 on the harmonisation of certain social legislation relating to road transport and amending Council Regulations (EEC) No 3821/85 and (EC) No 2135/98 and repealing Council Regulation (EEC) No 3820/85 has been adopted in order to introduce clearer and simpler rules about driving times, break and rest periods for professional drivers operating both national and international transport. Indeed, this Regulation has tried to bring effective solutions to the problems that have been experienced in interpreting, applying, enforcing and monitoring the provisions included in the Regulation (EEC) 3820/85.

Finally it should be remembered the carried out regulations regarding the adaptation to technical progress of recording equipment in road transport, such as the Commission Regulation (EC) 1360/2002 of 13 June 2002, Commission Regulation (EC) 432/2004 of 5 March 2004 and Commission Regulation (EC) 68/2009 of 23 January 2009.

**Classification:** *technical specification.*

### **State of implementation**

*Completed.*

### **Impact on road safety**

**Type of impact:** *indirect.*

**Timing of the effects:** *short term.*

**Consistency with other measures:** the measure is consistent with the general aim of improving the working and safety conditions for the drivers of commercial vehicles.



## Ex-post evaluation

### Outcomes

The Regulation 561/2006 has made the introduction of digital tachographs mandatory in vehicles put into service for the first time in the European Union from the 1st of May 2006. This obligation regarded the vehicles used for the carriage of goods having a maximum weight exceeding 3,5 tonnes and vehicles used for the carriage of persons containing more than eight seats apart from the driver's seat.

In addition the Regulation 561/2006 has provided for the installation of digital tachographs at the moment of the replacement of the previous equipments for the vehicles used for the carriage of persons containing more than eight seats apart from the driver's seat and having a maximum weight exceeding 10 tonnes, and also vehicles used for the carriage of goods having a maximum weight exceeding 12 tonnes, registered for the first time as from 1 January 1996.

Commission Regulation (EC) 1360/2002, 432/2004 and 68/2009 contains technical specifications for digital tachograph in order to adapt them to the technical progress.

**Effectiveness:** *medium.*

Digital tachographs are used to control drivers' hours, and for secondary purposes such as for instance accident investigation. Concerns on their effectiveness are mainly tied to the threat of manipulation and misused, thus hampering the quality and level of enforcement and consequently the potential benefits on road safety.

**Efficiency:** *medium.*

A full deployment of the digital tachograph may provide transport companies a tool for an easier and improved management of transport operations, while for enforcers a more efficient instrument for controlling the compliance to the Regulation. This may result in an increase in road safety, since the digital tachograph makes possible a more efficient enforcement of European rules on rest and driving times, by: (i) improving road security and working conditions of drivers, and (ii) guarantee a fairer competition. However, continuous training and adequate equipment (onboard and for checks) are key.

**Sustainability:** *medium.*

In the long term, the deployment of the tachograph may pose concerns related to the technical development and maintenance of such tool. In addition, concerns may rise on the capability of national enforcement authorities to implement sound controls.

## Results

**Description of the impact:** monitoring the behaviour of the professional drivers constitute for them an incentive to perform correctly, therefore increasing road safety.

**Contribution to road safety:** *medium results.*

**What remains to be done (ERSAP 2011-2020):** measure completed.

## Sources

Council Regulation (EEC) No 3821/85 on recording equipment in road transport, 20 December 1985

Council Regulation (EC) No 2135/98 amending Regulation (EEC) No 3821/85 on recording equipment in road transport, 24 September 1998

Regulation (EC) 561/2006 of the European Parliament and the Council of the European Union, 15 March 2006

## **Measure 51 Best practice guidelines concerning company policies**

**Objective:** improving road safety involving road transport companies.

### **Description**

The project TRANSPORT COMPANIES (Application of road safety related Community legislation in transport companies), funded by DG TREN, aimed to the assessment of how road transport companies can be better involved for the improvement of the road safety. The safety situation in the road haulage companies has been investigated by a combination of questionnaires and expert interviews. Potential measures to improve safety performance, especially outside the Europe, have been also investigated to determine best practice.

**Classification:** *best practice.*

### **State of implementation**

The duration of the considered project was from 1 December 2003 until 1 February 2005.

*Low advancement*

### **Impact on road safety**

**Type of impact:** *indirect.*

**Timing of the effects:** *medium term.*

**Consistency with other measures:** the measure is consistent with the general aim of increasing the safety in the road professional transport, and in particular with Measures 52 and 53.

### **Ex-post evaluation**

#### **Outcomes**

The final report of the project provided a set of conclusions and recommendations as well as an action package, in which the most “promising” actions to consider have been listed. In particular, such actions have been grouped under four headings: vehicle technology and its usage, the driver, safety culture and compliance.

**Effectiveness:** *low.*

The research in this domain, despite the results of TRANSPORT COMPANIES project, has not yet received any follow-up.

**Efficiency:** *medium.*

TRANSPORT COMPANIES project cost: 295,150 euro.

TRANSPORT COMPANIES project EC funding: n.a.

The exchange of best practices at European level supports improvements and enhancements in the actions taken in the field of company policies at national or local level.

**Sustainability:** *high.*

If taken in account, the effects of the recommendations provided by the 'TRANSPORT COMPANIES' project could potentially last in the long term.

## Results

**Description of the impact:** involving transport companies for a safer road professional transport could increase the safety of all road users.

**Contribution to road safety:** *low results.*

**What remains to be done (ERSAP 2011-2020):** the measure should be continued.

## Sources

TRANSPORT COMPANIES project (2004), Application of road safety related Community legislation in transport companies, Final Report, October 2004

## **Measure 52 Best practice guidelines concerning the securing of loads and the carriage of exceptional loads**

**Objective:** improving road safety through a better management of loads carriage.

### **Description**

As a practical step towards more road safety and transport efficiency throughout the European Union, the European Commission Directorate-General for Energy and Transport has asked experts from Member States and industry to develop guidelines reflecting best practice on cargo securing and abnormal transports.

An expert group prepared a report regarding best practice guidelines for abnormal road transports. The document was presented to the Road Safety High Level Group, which gave a positive opinion concerning its content and scope. These best practice guidelines can be a reference for all parties directly or indirectly concerned by abnormal road transports, but are primarily addressed to the relevant authorities in the Member States. The document was developed with and received the agreement of Member States' government experts and other concerned parties. The best practice guidelines are intended to pave the way towards simplification and, if possible harmonisation of the rules and procedures to obtain abnormal road transport permits as well as define the conditions under which procedures could be simplified.

In addition, best practice guidelines on cargo securing for road transport have been prepared. Rules on cargo securing exist in several Member States, but they often differ in content and scope, making it very difficult for international transporters to know what the minimum cargo securing requirements are for a given cross-border transport operation. The purpose of such guidelines is to provide basic practical advice and instructions to all persons involved in loading/unloading and securing a cargo on vehicles, including carriers and shippers. They should also be useful for enforcement bodies and courts. It could also serve as a basis for Member States when taking the necessary steps for putting into practice the training of drivers in accordance with Directive 2003/59/EC on the initial qualification and periodic training of drivers of certain road vehicles for the carriage of goods or passengers. The guidelines aim to provide a guide for adequate cargo securing for all situations that may occur in normal traffic conditions. The guidelines should also serve as a common basis for both practical application and enforcement of cargo securing.

It is also worth to mention the project GOODROUTE (Dangerous GOODS Transportation ROUTing, Monitoring and Enforcement) which started in 2006 with the objective to develop a proper system for the routing of dangerous goods vehicles in order to minimise the risks related to the movements of this kind of vehicles.

**Classification:** *best practice.*

### **State of implementation**

The work of the experts involved by European Commission Directorate-General for Energy and Transport was finished in 2006.

The project GOODROUTE started on 1 January 2006 and it is expected to be completed on 31 December 2009.

*Completed*

## Impact on road safety

**Type of impact:** *indirect.*

**Timing of the effects:** *medium and long term*

**Consistency with other measures:** this measure is consistent with all the actions aimed at improving road transport safety, and in particular with Measures 51 and 53.

## Ex-post evaluation

### Outcomes

The document regarding abnormal roads transports:

- exposes the conditions and concepts which could greatly simplify the procedures and improve the conditions under which important segments of the European economy, especially the building and production sectors, have to operate, leading to more timely and predictable abnormal road transports;
- proposes a single vehicle registration document adapted to abnormal road transports requirements, which takes into account current practice in certain Member States;
- presents the principles under which European abnormal road transports corridors could be developed in order to facilitate cross-border abnormal road transport operations;
- with regard to marking and signalling, proposes a relatively simple system achieving optimal effectiveness, according to the expert group;
- provides indications about escorts and self-propelled machinery, a particular group of abnormal road transport where it is the vehicle itself that does not comply with the European legislation on maximum authorised weights and dimensions for road vehicles.

The report on cargo securing provides best practice guidelines and recommendations regarding:

- vehicle body structure and equipment suitable for blocking on vehicles;
- restraining methods;
- calculating the number of lashings;
- inspection during drive / multidrop operations;
- standardised or semi-standardised cargo (geometrical forms);
- requirements for some specific loads.

**Effectiveness:** *medium.*

It has been estimated that up to 25% of accidents involving trucks can be attributable to inadequate cargo securing.

**Efficiency:** *medium.*

GOODROUTE project cost: 4,890,000 euro.

GOODROUTE project EC funding: 2,800,000 euro.

The exchange of best practice is an efficient tool to enhance the securing of loads and the carriage of exceptional loads.

**Sustainability:** *high.*

If taken in account by Member States, the effects on road safety of the indications and recommendations provided by the reports mentioned could potentially last in the long term.

## Results

**Description of the impact:** Adopting best practice guidelines for the securing of loads and the carriage of exceptional loads contributes to improve working conditions in the road professional transport and at the same time to increase the safety for the whole road sector.

**Contribution to road safety:** *medium results.*

**What remains to be done (ERSAP 2011-2020):** action should be taken to encourage the adoption of the developed best practices guidelines.

## Sources

European Commission, DG Energy and Transport, European Best Practice Guidelines on Cargo Securing for Road Transport, 2006

European Commission, DG Energy and Transport, European Best Practice Guidelines for Abnormal Road Transports, 2006

## **Measure 53 Adapting to technical progress the Community legislation concerning the carriage of hazardous goods**

**Objective:** making European roads safer.

### **Description**

The Directive 2008/68/EC establishes a common regime for all aspects of the inland transport of dangerous goods, by road, rail and inland waterways within Member States or between several Member States, including the activities of loading and unloading, the transfer to another mode of transport and the stops necessitated by the circumstances of the transport. It repeals and replaces Directives 94/55/EC, 96/49/EC and 96/35/EC with the objective of minimising the risks in transporting dangerous goods and ensuring these goods are packaged and carried in a way that prevents leakage and protects the population, environment and economy.

The Directive refers to the texts of the international agreements on transport of dangerous goods ADR (the European Agreement concerning the International Carriage of Dangerous Goods by Road of the 30<sup>th</sup> of September 1957), RID (the Regulations concerning the International Carriage of Dangerous Goods by Rail of the 3<sup>rd</sup> of June 1999) and AND (the European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways of the 26<sup>th</sup> of May 2000).

These agreements have drawn up a list of dangerous goods, defining the requirements for their transport. The Directive 2008/68/EC extends their rules to national transport in order to harmonise across the Community the conditions under which dangerous goods are transported and to ensure the proper functioning of the common transport market.

The Commission Decision 2009/240/EC of the 4<sup>th</sup> March 2009 transfers certain derogations previously granted under the ADR and RID Framework Directives to the new Inland Transport of Dangerous Goods Directive 2008/68/EC.

Concerning controls, the Commission Directive 2004/112/EC adapted the procedures for checks on the transport of dangerous goods by road the Directive 2001/26/EC.

**Classification:** *EU norm.*

### **State of implementation**

The Directive 2008/68/EC entered into force the 20 October 2008. Member States must comply with it by 30 June 2009.

Member States have a transitional period of up to two years (until 30 June 2011) for the application of the Directive to the transport of dangerous goods by inland waterway, so as to allow sufficient time for the adaptation of national provisions, the establishment of legal frameworks and the training of personnel.

*Completed*

### **Impact on road safety**

**Type of impact:** *indirect.*



**Timing of the effects:** *medium term.*

**Consistency with other measures:** the scope of this measure is consistent with the aim of increasing road transport safety, and in particular with Measures 51 and 52.

## Ex-post evaluation

### Outcomes

- Directive 2004/112/EC
- Directive 2008/68/EC

**Effectiveness:** *not computable.*

**Efficiency:** *not computable.*

**Sustainability:** *high.*

Once adopted, the rules concerning transport of hazardous goods are expected to secure a higher level of road safety in the long run.

## Results

**Description of the impact:** defining clear, harmonised and effective rules for the transport of hazardous goods contribute to minimise the risk associated with the transport of dangerous goods, at the same time improving working and safety conditions in road professional transport.

**Contribution to road safety:** *medium results.*

**What remains to be done (ERSAP 2011-2020):** monitoring the implementation at national level.

## Sources

Directive 2008/68/EC of the European Parliament and of the Council on the inland transport of dangerous goods, 24 September 2008

European Commission, Decision 2009/240/EC authorising Member States to adopt certain derogations pursuant to Directive 2008/68/EC of the European Parliament and of the Council on the inland transport of dangerous goods, 4 March 2009

Department for Transport of the United Kingdom, Explanatory memorandum No. 1348 to the carriage of dangerous goods and the use of transportable pressure equipment regulations, May 2009

European Commission, Directive 2004/112/EC adapting to technical progresses Directive 2001/26/EC, 13 December 2004

Directive 2001/26/EC of the European Parliament and of the Council amending Council Directive 95/50/EC, 7 May 2001

## **Measure 54 Making the wearing of seatbelts mandatory in coaches and heavy goods vehicles**

**Objective:** reduction of injuries for bus and coach passengers in case of accident.

### **Description**

The [Directive 2003/20/EC](#) requires all bus and coach passengers to use seat belts (or child restraints, where appropriate and available) where they are installed.

It amends the earlier Directive 91/671/EEC on the approximation of the laws of Member States relating to compulsory use of seat belts. In particular, it introduces the requirement that all occupants aged three and over of M2 (buses and coaches having a maximum gross weight not exceeding 5,000 kg) and M3 vehicles (buses and coaches over 5,000 kg) in use shall wear the safety systems provided while they are seated.

**Classification:** *EU norm.*

### **State of implementation**

*Completed*

### **Impact on road safety**

**Type of impact:** *direct.*

**Timing of the effects:** *short term.*

**Consistency with other measures:** this measure is consistent with the aim of increasing the safety of vehicle occupants; in particular, it is linked with the scope of Measures 21, 25 and 55.

### **Ex-post evaluation**

#### **Outcomes**

Directive 2003/20/EC

**Effectiveness:** *not computable.*

There are no separate figures for vehicles fitted and not-fitted with seat belts and available statistics do not identify if passengers were, or were not, wearing available seat belts at the time of accident. Therefore, a scientific quantification of the impact on road safety is not feasible.

**Efficiency:** *medium.*

The efficiency is rated as medium, and not as high, since the mandatory use of seat belts is applied only for vehicles provided with those, while the installation itself is not mandatory.

**Sustainability:** *high.*

Once the whole fleet is equipped with seat belts, the use of such system is expected to reduce the severity of road accidents in the long run.

## Results

**Description of the impact:** wearing seatbelts reduce the risk of personal damage and the potential severity of injury in case of accident.

**Contribution to road safety:** *medium results.*

**What remains to be done (ERSAP 2011-2020):** monitoring the implementation at national level while supporting the installation of seat belts in all coaches and HGVs.

## Sources

Directive 2003/20/EC of the European Parliament and of the Council amending Council Directive 91/671/EEC on the approximation of the laws of the Member States relating to compulsory use of safety belts in vehicles of less than 3,5 tonnes, 8 April 2003

UK Department for Transport, Partial Impact Assessment of the requirement to use seat belts in buses/coaches, 14 August 2007

Department for Transport of the United Kingdom, Reported Road Casualties Great Britain: 2008, Annual Report, September 2009

## **Measure 55 Introducing protection rules for vehicles regularly used for the carriage of children**

**Objective:** improving child safety in road transport.

### **Description**

Road traffic accidents are the main cause of mortality for children up to 15 years old. Crashes involving school buses and crashes involving children travelling to school require a focused effort to be drastically reduced. To address this problem and improve children road safety, the EC has carried out several actions.

On the legislative side, the EU [Directive 2003/20/EC](#) covering seat belt wearing requires children up to the age of 12 years or less than 150cm tall (where there is an exemption, 135cm) travelling in cars, vans and goods vehicles to use an appropriate child restraint.

According to this Directive, child restraints systems for child occupants of power-driven vehicles sold in the EU must conform to the [UNECE Regulation 44](#). This regulation need to be updated in order to take into account restraint systems for children up to 150 cm. To this aim, several EC projects have been working on the development and improvement of child protection systems.

Moreover, several research projects in the domain of child safety have been funded.

The [CHILD project](#) carried out the investigation of injury mechanisms and tolerances specifically regarding children in order to contribute to revised or improved standards and more efficient design of child restraint systems. The main objective project was to increase the level of knowledge of the injury mechanisms experienced by children of different ages in road accidents. In addition, CHILD complimented the activities of Euro NCAP with regard to child occupant protection assessment, establishing protection reference values for body regions such as the neck.

The [project School Transport](#) (Road Safety in school transport) studied the key issues relating to school transport and made recommendations in the light of the existing and upcoming legislation in this domain. The final objective was evaluating the need for further legislation or action at the Community or Member State level.

The [NPACS project](#) (New programme for the assessment of child seats) aimed at providing independent published guidance to consumers on the relative protection afforded by child restraint systems. Through reliable methods of dynamic testing in collaboration with EU research and testing organisations, it developed an harmonised testing procedure with the objective of establishing a EuroNCAP type body. Compared to Euro NCAP, which rates the combination of a particular car model and a child restraint system, NPACS tests separately the child restraint system safety performance across most vehicle models.

The [EPOCH project](#) (Enabling protection for older children), funded under the Seventh Framework Programme, aims to extend the NPACS testing and rating protocols to include child restraints for older children (developing a prototype 10/12 year old dummy). The final objective is to make proposals for the assessment of child restraints in the UNECE Regulation 44.

Finally, the [project SAFEWAY2SCHOOL](#) (Integrated system for the safe transportation of children to school) aims to design, develop, integrate and evaluate technologies for providing a holistic and safe transportation service for children, encompassing tools, services and training for all key actors in the

relevant transportation chain. These include optimal route planning for school buses to maximize safety, on-board safety applications (i.e. for speed control and seat belts), intelligent bus stops, effective warning and information systems for bus drivers, children, parents and the surrounding traffic, as well as training schemes for all actors. The project innovative systems, services and training schemes will be tested in Sweden, Austria, Italy and Poland to evaluate their usability, efficiency, user acceptance and market viability.

**Classification:** *thematic and research projects.*

### State of implementation

Duration of the CHILD project: from 1 September 2002 to 31 August 2005.

Duration of the School Transport project: from 1 December 2003 to 1 October 2004.

Duration of the NPACS project: from 1 January 2004 to 1 January 2006.

Duration of the EPOCH project: from 1 January 2009 to 31 December 2011.

Duration of the SAFEWAY2SCHOOL project: from 1 September 2009 to 31 August 2012.

Thematic studies are still in progress.

*Medium advancement*

### Impact on road safety

**Type of impact:** *direct.*

**Timing of the effects:** *medium term.*

**Consistency with other measures:** this measure is tightly linked with the implementation of Measure 22 (introduction of universal anchorage systems for child restraint devices).

### Ex-post evaluation

#### Outcomes

The CHILD project produced seven technical deliverables on the use of child restraint systems. It assessed new child dummies, tested different criteria for child occupant protection and investigated the misuse, inappropriate use and non-use of child restraints and its consequences.

The NPACS project produced scientifically based test methods and assessment protocols providing independent guidance to consumers on ways to assess the relative performance of child seats. These protocols and tests establish child seat usability, dynamic crash performance (front and side) and provide an easy to understand rating system.

The project School Transport presented several recommendations aimed at the development of a work programme on road safety in school transport in the European Union. Results lead to a higher attention to continuous training of drivers and to improvements in data collection and analysis.

The projects EPOCH and SAFEWAY2SCHOOL have recently started and are still ongoing. Up to now, the EPOCH project produced nine deliverables.

**Effectiveness:** *high.*

Clear statistical information on school transport enabling the correct assessment and comparability of safety levels for school, public and private modes of transport is not available. Generally, accident data only considers a school transport accident when it takes place with a vehicle identified as such, while the definition of school transport accident should be extended to all transport modes (public, private, walking and cycling), in order to have a clear assessment. Otherwise, private cars will continue to be perceived as a safer mode, while instead they present lower safety records when compared to public transport and they increase accident risks by generating more traffic (School Transport, 2004).

**Efficiency:** *medium.*

CHILD project cost: 4,506,640 euro

CHILD project EC funding: 2,985,754 euro

School Transport project cost: 118,607 euro

School Transport project EC funding: n.a.

NPACS project cost: 2,243,527 euro

NPACS project EC funding: 600,000 euro

EPOCH project cost: 2,211,194 euro

EPOCH project EC funding: 1,400,000 euro

SAFEWAY2SCHOOL project cost: 3,670,000 euro

SAFEWAY2SCHOOL project EC funding: 2,760,000 euro

The research still need to find a concrete application.

**Sustainability:** *medium.*

The research needs to be integrated and its results applied.

## Results

**Description of the impact:** introducing protection rules for the carriage of children is a measure which not only directly improve child safety in vehicles by providing a more and more appropriate restraint systems, but also help increasing the attention level of the driver. In fact, according to a research carried out in the UK, the Netherlands, Belgium and Germany (EPOCH, 2009), for 30% of the parents children distracting them in the back of the car is the cause of a (near) accident.

**Contribution to road safety:** *medium results.*

**What remains to be done (ERSAP 2011-2020):** the results of the thematic researches will need to be integrated and applied. Relative statistics need to be improved.

## Sources

CHILD website

NPACS website

EPOCH website

UNECE, Regulation 44, Revision 2, Agreement concerning the adoption of uniform technical prescriptions for wheeled vehicles, equipment and parts which can be fitted and/or be used on wheeled vehicles and the conditions for reciprocal recognition of approvals granted on the basis of these prescriptions, 4 February 2008

EPOCH, Current legislation for child restraint systems and consumer behaviour research, 10 June 2009

TIS, Final Report of the School Transport project, 15 December 2004

School Transport, Final Report, 15 December 2004

## **Measure 56 Examining the impact on road safety of the growing use of small commercial vehicles and company vehicles**

**Objective:** supporting policy making.

### **Description**

The increasing participation of light goods vehicles (LGVs) in road traffic, especially considering the raise of courier and express services, is of growing concern for road safety; in fact, both the number of LGVs and their participation in accidents increased.

The project IMPROVER (Impact Assessment of Road Safety Measures for Vehicles and Road Equipment), and in particular the Subproject 2, examined the impact of the measures improving the road safety of light vans (vehicles for the carriage of goods with a weight of more than 1 and less than 3.5 t).

The researches carried out within the project estimated that each year (considering as reference period from 1995 to 2005) more than 4,000 people die in the EU25 in accidents with light goods vehicles and more than 20,000 are severely injured. Moreover, between 1995 and 2005, the number of LGV-accidents with fatally injured road users increased on all road types: by 6% on urban roads, 8% on rural roads and 32% on motorways (IMPROVER, 2006).

**Classification:** thematic study.

### **State of implementation**

Duration of the project IMPROVER: from 23 November 2004 to 23 May 2006.

*Completed*

### **Impact on road safety**

**Type of impact:** *indirect.*

**Timing of the effects:** *long term.*

**Consistency with other measures:** the research development is closely connected with the studies carried out in the framework of the Measure 28 (examine the impact of the proliferation of 4x4s, SUVs and MPVs).

### **Ex-post evaluation**

#### **Outcomes**

The IMPROVER Subproject 2:

- analysed the scope of the problem in the EU25;
- identified and defined road safety measures for LGV;
- carried out cost-benefit-analyses for each measure;



- derived recommendations on the implementation of road safety measures dedicated to LGV.

**Effectiveness:** *medium.*

The research in this domain, despite the important results, has not yet received any follow-up.

**Efficiency:** *medium.*

IMPROVER project cost: 1,402,571 euro.

IMPROVER project EC funding: n.a.

The Cost-Benefit Analysis carried out within the project IMPROVER yielded a positive ratio (benefit/cost greater or equal to 1) for the measures concerning a professional driver training programme (ratio: 2.2), devices to increase seatbelt wearing (ratio: 5.3) and ESP (ratio: 1.0), indicating that these safety systems are economically justified for LGV.

**Sustainability:** *medium.*

The research is expected to support decision making, providing a sound basis for future improvements in the safety not only for road professional transport, but for all road users.

## Results

**Description of the impact:** understanding the effects on road safety of the proliferation of small commercial vehicles is crucial to define the intervention strategy that needs to be adopted in order to increase road safety.

**Contribution to road safety:** *medium results.*

**What remains to be done (ERSAP 2011-2020):** the research is completed. Action needs to be taken in the framework of the measures addressing the safety of professional drivers (namely, Measures 48, 49 and 51).

## Sources

IMPROVER, Subproject 2 final report, Impact assessment of measures concerning the improvement of road safety of light goods vehicles, April 2006

## **ACCIDENTOLOGY**

- Measure 57: Examine best practice with regard to post-accident medical care
- Measure 58: Draw up specifications for satellite-positioning accident-warning systems and carry out demonstration projects involving the whole chain of emergency service provision
- Measure 59: Develop the CARE database and widen access to it, in the interest of achieving greater transparency and encouraging its use; expand CARE to include hazard exposure variables and the causes of accidents
- Measure 60: Assess and improve systems for linking hospital data and national road accident statistics
- Measure 61: Develop specifications for on-board accident recording devices, and examine the consequences of various alternatives for certain categories of vehicles
- Measure 62: Establish a European methodology for independent road accident investigations and set up a group of independent experts meeting within the Commission

## **Measure 57 Examine best practice with regard to post-accident medical care**

**Objective:** improving post-accident care by providing information on outstanding safety measures.

### **Description**

The post-accident medical care consists of first aid measures, emergency call, response of emergency systems, safeguarding of accident sites, transportation and medical treatment for the victims, further medical treatment and psychological support

The project SUPREME (Summary and publication of best Practices in Road safety in the EU Member States) had the goal to collect, analyse, summarise and publish best practices in road safety in the European Union as well as in Switzerland and Norway.

The analysis was carried out along nine categories of measures, one of them being post accident care.

**Classification:** *thematic study.*

### **State of implementation**

Duration of the project SUPREME: from 1 December 2005 to 1 June 2007

*Completed*

### **Impact on road safety**

**Type of impact:** *indirect.*

**Timing of the effects:** *medium term.*

**Consistency with other measures:** this measure shares the scope of Measure 58, that is improving post-accident care.

### **Ex-post evaluation**

#### **Outcomes**

A specific Thematic Report on the best practices related to post accident care was published. It describes the best available practices, featuring basic characteristics such as target groups, quantitative and qualitative goals, key issues, duration of implementation and effects, coverage, costs, actors involved, implementation procedures as well as key success factors and potential implementation barriers in other countries.

**Effectiveness:** *high.*

The exchange of best practices at European level effectively supports improvements and enhancements in the actions taken in the field of post accident care at national or local level.

**Efficiency:** *high.*

SUPREME project cost: n.a.

SUPREME project EC funding: n.a.

A quantification of costs and benefits is not feasible. However, it may be reasonably assumed that the potential benefits overcome the costs of the research.

**Sustainability:** *medium.*

If taken into account by Member States, the exchange of best practices on post-accident care are expected to have a durable impact on road safety.

## Results

**Description of the impact:** identifying best practice examples helps to improve and innovate the emergency systems in Europe and to optimize the medical treatment of victims in order to save more lives, supporting policy-makers in the development and implementation of the best available strategies.

**Contribution to road safety:** *high results.*

**What remains to be done (ERSAP 2011-2020):** the thematic research is completed. Action needs to be taken to integrate the results of the study in the European systems of post-accident medical care.

## Sources

SUPREME, Thematic Report, Post Accident Care, 17 June 2007

**Measure 58 Draw up specifications for satellite-positioning accident-warning systems and carry out demonstration projects involving the whole chain of emergency service provision**

**Objective:** promoting the use of ICTs to improve post-accident care and achieve safer roads.

**Description**

The European Commission supported several projects with the aim of reducing the consequences of road traffic accidents by deploying a system to immediately alert the emergency services.

Such system was first conceived and developed under the project AIDER, funded under the fifth Framework Programme. The aim of the AIDER project was to develop a kind of automotive “black box”, similar to the devices in airplanes, which continually assesses the car's environment and, in case of accident, alerts a call centre with essential details about the nature of the crash. The emergency services would be contacted immediately and, knowing the details of the accident, they would arrive both more quickly and prepared for specific injuries.

The eCall programme received the task of optimising the in-car automatic emergency call system developed within the framework of the projects AIDER, E-MERGE and GST-Rescue and to make the technology work across borders. ECall is a system that automatically dials 112, Europe's single emergency number, when a car has a serious accident and sends its location to the nearest emergency service – even when passengers do not know or cannot say where they are.

The Commission has further supported work on eCall through industry cooperation via the eSafety Initiative, which seeks to improve road safety by fitting "intelligent" safety systems based on advanced electronic technologies into road vehicles (see Measure 37).

**Classification:** *thematic study.*

**State of implementation**

Duration of the project AIDER: from 1 September 2001 to 31 August 2004.

Duration of the project E-MERGE: from 1 April 2002 to 31 March 2004.

Duration of the project GST-Rescue: from 1 March 2004 to 31 March 2007.

Duration of the project eCall: n.a.

The eCall technology is ready and common pan-EU standards have been agreed by the phone and car industry and by the emergency services. Since 2004, 79 representatives of the industry and 18 national Authorities have signed the EU's Memorandum of Understanding to implement the system across Europe.

15 EU countries (Austria, Cyprus, Czech Republic, Estonia, Finland, Germany, Greece, Italy, Lithuania, Portugal, Slovakia, Slovenia, Spain, the Netherlands and Sweden) as well as 3 EEA countries (Iceland, Norway and Switzerland) have agreed common arrangements for implementing eCall. Another 6 (Belgium, Bulgaria, Hungary, Luxembourg, Romania and Poland) support the programme and are willing to sign the agreement. Instead, Denmark, France, Ireland, Latvia, Malta and the UK are still not ready to commit, mainly for cost concerns, and have not signed the Memorandum.

In April 2006, the European Parliament voted by a large majority to adopt the eCall safety system for all new cars from 2009.

By the end of 2010, eCall should become a standard option in all new type-approved vehicles. But to fully deploy it, Europe's car and telecoms industries and national administrations must ensure that their emergency services (i.e. call centres) are equipped to handle the system.

*Completed*

### Impact on road safety

**Type of impact:** *indirect.*

**Timing of the effects:** *medium term.*

**Consistency with other measures:** this measure shares the scope of Measure 57, that is improving post-accident care.

### Ex-post evaluation

#### Outcomes

The Memorandum of Understanding for Realisation of Interoperable In-Vehicle eCall was adopted on the 28<sup>th</sup> of May 2004.

**Effectiveness:** *high.*

Rolling out eCall could save up to 2,500 lives each year in the EU and, when fully deployed, can reduce the severity of injuries by 10 to 15% (EU Commission, DG INFSO, 2009).

**Efficiency:** *high.*

The European Commission estimated that equipping all 230 million cars in the EU with the eCall system could save euro26 billion annually (Commission Communication, 2009).

AIDER project cost: 4,875,546 euro

AIDER project EC funding: 2,595,702 euro

E-MERGE project cost: 4,260,000 euro

E-MERGE project EC funding: 2,040,000 euro

GST-Rescue project cost: 22,133,669 euro

GST-Rescue project EC funding: 11,100,974 euro

eCall project cost: n.a.

eCall project EC funding: n.a.

**Sustainability:** *high.*

The effects of the implementation of the eCall system are expected to last in the long term.

## Results

**Description of the impact:** the eCall system will help to reduce the number of fatalities and the severity of the injuries by enabling a more immediate intervention of the emergency services. The system will also support the development of the technologies to manage road traffic congestion and to install services like satellite navigation in cars.

**Contribution to road safety:** *high results.*

**What remains to be done (ERSAP 2011-2020):** six Member States have still not signed the eCall Memorandum of Understanding. The Telecoms Commissioner, Vivian Reding, invited them to take action and commit to the introduction of a system that can save lives. Otherwise, the Commission will need to propose legislation next year (EU Commission Press Release, 9 September 2009).

## Sources

Europe's Information Society Portal

E-MERGE website

eSafety website

eSafety support website

eSafety Forum, eCall Driving Group, Memorandum of Understanding for Realisation of Interoperable In-Vehicle eCall, 28 May 2004

European Commission, Communication COM(2009) 434 final to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, eCall: Time for Deployment, 21 August 2009

European Commission, Press release IP/09/1290, Saving more lives on Europe's roads: mobile phone operators sign up for eCall roll-out, 9 September 2009

**Measure 59 Develop the CARE database and widen access to it, in the interest of achieving greater transparency and encouraging its use; expand CARE to include hazard exposure variables and the causes of accidents**

**Objective:** build a statistical and scientific basis contributing to the improvement of road safety.

**Description**

Several research projects have been carried out in order to expand the CARE database, developed in the framework of the SafetyNet project (see Measure 2), to increase the number of variables and to improve their quality.

The PENDANT project (Pan-European Coordinated Accident and Injury Database) was established to develop a new in-depth crash-injury database. It focuses on accident causation data, a linked police-hospital injury database and on accident investigation tools to support development of databases, harmonisation of collision severity assessment methods, impairment scales and injury severity scaling methods for casualty reduction. In 2006 a second phase of the project was launched.

The project PROLOGUE (Promoting real life Observations for Gaining Understanding of road behaviour in Europe) aims at developing techniques for naturalistic observations, where road user behaviour is observed unobtrusively in a natural setting for a longer period of time. The main objective is to prove the feasibility and usefulness of a large-scale European naturalistic observation study.

The project TRACE (Traffic Accident Causation in Europe) had the objective of providing with an overview of the road accident causation issues in Europe based on the analysis of all current available databases which include accident, injury, insurance, medical and exposure data (including driver behaviour in normal driving conditions). The idea was to identify and quantify the nature of risk factors, in order to estimate the safety benefits of a selection of technology-based safety functions.

For what concerns motorcycles, the Motorcycle Accidents In Depth Study (MAIDS) resulted in the most comprehensive in-depth database currently available for powered two wheelers accidents in Europe. The investigation was conducted during 3 years on 921 accidents from 5 countries using a common research methodology.

Then, in order to identify the main causes of accidents involving trucks, the European Commission and the International Road Transport Union (IRU) launched a scientific study on European Truck Accident Causation (ETAC). The experts team has investigated altogether 624 accidents involving trucks.

The project SAU (Urban accident analysis system) focused on urban zones, developing a guide of “best practices” for the data collection, analysis and monitoring of traffic accidents.

The project SARAC II (Quality Criteria for the Safety Assessment of Cars based on Real-World Crashes) aimed at developing advanced method of safety ratings, improving classification of injury severity, impact severity and vehicle damage.

Finally, DaCoTa (Road safety data collection, transfer and analysis) is a project funded under the Seventh Framework Programme aimed at further improving the European Road Safety Observatory (ERSO) by enhancing, structuring and applying the data and knowledge it contains. It represents the follow-up of the projects SafetyNet and SUNflower and involves 17 partners from 13 countries. It covers subjects as accident data, measure evaluation and policy benchmarking with the aim of



developing innovative mechanisms for exploiting existing data sources, to facilitate the analysis and to explore potential road safety improvements. It started in May 2009.

**Classification:** *statistics.*

### State of implementation

Duration of the SafetyNet project: from 1 December 2004 to 1 December 2008.

Duration of the MAIDS project: from 1 December 2001 to 1 December 2002.

Duration of the PENDANT project: - from 1 January 2003 to 1 December 2005;

- from 16 January 2006 to 15 July 2016.

Duration of the ETAC project: from 1 May 2004 to 30 September 2006.

Duration of the SARAC II project: from 1 March 2003 to 1 April 2006.

Duration of the SAU project: from 1 April 2004 to 31 March 2007.

Duration of the TRACE project: from 1 January 2006 to 30 June 2008.

Duration of the DaCoTa project: from 1 May 2009 to 31 October 2011.

Duration of the PROLOGUE project: from 1 August 2009 to 31 July 2011.

*Medium advancement*

### Impact on road safety

**Type of impact:** *indirect.*

**Timing of the effects:** *short, medium and long term.*

**Consistency with other measures:** data collection is functional to all other measures concerning research and thematic analyses. Moreover, this measure has a strong link with Measure 60 (linking hospital data and accident statistics).

### Ex-post evaluation

#### Outcomes

The CARE database has been enhanced to include, from 15 Member States, a total of 27 Member States as well as Norway, Switzerland and Iceland.

A range of standard statistical outputs from CARE (reports and factsheets) has been developed.

New fatal and in-depth accident causation databases have been established, in particular concerning motorcycles (MAIDS) and trucks (ETAC). The MAIDS study resulted in a report that has recently been updated (MAIDS, 2009) with a new presentation of the data, including a split between mopeds (L1) and motorcycle (L3), and a multivariate analysis on fatal accidents describing the results achieved by the project. The ETAC study enabled the creation of a database to record all accident causes with

around 3,000 parameters per accident. The results have been made available to the research community and other relevant parties with the final report (ETAC, 2006).

The PENDANT research resulted in the definition of methods to assess collision severity and in the review of the traffic injury output scales; it also produced crash modelling methods for estimating casualty and injury reductions. Over 1,100 crash have been investigated and the data were organised in a new database.

DaCoTA is expected to become one of ERSO major deliverers of knowledge and data in the coming years. Within DaCoTA, the harmonising data methods will be further applied, resulting in more and more standardised data products on a European level.

**Effectiveness:** *medium.*

Data are still incomplete. Regarding data collection for the CARE database, some Member States have still not provided the complete set of data (Bulgaria, Lithuania, Romania, Germany, Cyprus, Slovenia and Slovakia), while others needs to update all or part of the information (Ireland, Italy, Luxembourg and Poland).

**Efficiency:** *high.*

MAIDS project cost: 781,770 euro

MAIDS project EC funding: 390,000 euro

ETAC project cost: 609,200 euro

ETAC project EC funding: 304,600 euro

PENDANT (first phase) project cost: 872,816 euro

PENDANT (first phase) project EC funding: 823,505 euro

PENDANT (second phase) project cost: 3,257,882 euro

PENDANT (second phase) project EC funding: 3,106,861 euro

TRACE project cost: 4,042,006 euro

TRACE project EC funding: 2,950,108 euro

DaCoTa project cost: 7,306,481 euro

DaCoTa project EC funding: 5,500,000 euro

PROLOGUE project cost: 2,462,556 euro

PROLOGUE project EC funding: 1,999,228 euro

SARAC II project cost: 1,438,789 euro

SARAC II project EC funding: 667,703 euro

SAU project cost: 309,852 euro

SAU project EC funding: 197,962 euro

Collecting exhaustive data can be very expensive; nevertheless the more detailed the statistics are, the more they can support and enhance sound policy development and thorough research.

**Sustainability:** *high.*

The information gathered within all these projects can be used to give guidance to policy and decision makers for future action which can contribute to the improvement of road safety.

## Results

**Description of the impact:** data collection and analysis provide a fundamental support to the definition of policy priorities and to the assessment of road safety initiatives and actions. The outcomes of the research will lead to a better understanding of road safety and will help to realise a safer road transport system.

**Contribution to road safety:** *high results.*

**What remains to be done (ERSAP 2011-2020):** reported statistics need to be constantly improved. Moreover, they could be more detailed in order to facilitate a deeper background analysis. Member States should be supported and encouraged to provide a complete set of data in line with the European criteria and requirements.

## Sources

SafetyNet website

MAIDS website

IST Portal

ETAC, Final Report, European Truck Accident Causation study, 2006

MAIDS, Final Report 2.0, In-depth investigations of accidents involving powered two wheelers, April 2009

SafetyNet Final Activity Report, Building the European Road Safety Observatory, January 2009

SafetyNet, Final Report of task 1.5, Enhancement of the CARE Accident Data, 8 December 2008

European Conference of Transport Research Institutes (ECTRI) and Forum of European Road Safety Research Institutes (FERSI), The sustainable safety approach to Road Transport and Mobility, 23 January 2009

## **Measure 60 Assess and improve systems for linking hospital data and national road accident statistics**

**Objective:** build a statistical and scientific basis contributing to the improvement of road safety.

### **Description**

The goal of collecting data by medical institutions is twofold, namely estimating the real number of non-fatal casualties and obtaining more information about injury severity and long term impact of traffic crashes.

The objective was firstly addressed in the framework of the PENDANT project (see Measure 59), which, among others, aimed at analysing both in-depth database and hospital-based data systems, in order to develop a new hospital-based data system linked with police data.

Besides, the project SUPREME, aimed at collecting and publish best practices in road safety in nine different categories of measures (see Measure 57), carried out a specific study on the methods of collecting data within the category “statistics and in depth analysis”.

The project refers to the results identified by the project SafetyNet. This project (see Measure 2) had the goal of developing the framework for the European Road Safety Observatory (ERSO), which assembles a coordinated set of data resources to support policy development. In particular, the Workpackage 5 on statistics and in-depth analysis reported on the practices for the collection of crash data and for linking medical files with crash data.

The projects SUPREME and SafetyNet identified the best practice in data collection and produced several recommendation regarding systems for linking hospital data and national road accident statistics. In particular, countries should:

- try to monitor the level of reporting in official crash statistics by setting up reporting systems at hospitals;
- encourage electronic linkages between sources of injury data or, even better, promote a system for electronically merging injury records kept by hospitals and police reported injury crashes;
- check the completeness of fatality records by comparing as many sources of data as possible (namely, crash registration by the police, court files with unnatural deaths, death causes file from the municipal records about population, car insurance and hospitals).

**Classification:** *statistics.*

### **State of implementation**

Duration of the SafetyNet project: from 1 December 2004 to 1 December 2008.

Duration of the PENDANT project: - from 1 January 2003 to 1 December 2005;

- from 16 January 2006 to 15 July 2016.

Duration of the SUPREME project: from 1 December 2005 to 1 June 2007.

*Medium advancement*

## Impact on road safety

**Type of impact:** *indirect.*

**Timing of the effects:** *medium term.*

**Consistency with other measures:** data collection is functional to all other measures concerning research and thematic analyses. Moreover, this measure has a strong link with Measure 59 (developing CARE database).

## Ex-post evaluation

### Outcomes

The project PENDANT, addressing the shortfall in injury-crash data (see Measure 59), carried out an analysis of hospital based data systems.

A specific Thematic Report on the best practices related to the linkage hospital data and national road accident statistics was published within the framework of SUPREME (SUPREME, 2007).

The SafetyNet project produced two deliverables relevant to this specific measure: the Final Report of task 1.5, analysing methods to estimate the real number of road accident casualties and a research dealing with the further enhancement and exploitation of the CARE system.

**Effectiveness:** *medium.*

The results of the research still need to find a wide application.

**Efficiency:** *high.*

SafetyNet project cost: 19,470,000 euro

SafetyNet project EC funding: 9,999,999 euro

PENDANT (first phase) project cost: 872,816 euro

PENDANT (first phase) project EC funding: 823,505 euro

PENDANT (second phase) project cost: 3,257,882 euro

PENDANT (second phase) project EC funding: 3,106,861 euro

SUPREME project cost: n.a.

SUPREME project EC funding: n.a.

Linking hospital data and national road accident data may produce important synergies in statistics and strengthen the reliability of the output.

**Sustainability:** *high.*

The information gathered within all these projects is expected to support policy-makers in the definition of the strategies contributing to road safety.

## Results

**Description of the impact:** reliable statistics are essential for effective research and the development of well founded national road safety strategies.

**Contribution to road safety:** *medium results.*

### What remains to be done (ERSAP 2011-2020):

- studies designed to assess the level and accuracy of reporting in official road crash statistics should be performed regularly;
- studies should be made to determine the extent to which injuries recorded by medical institutions can be geographically located correctly;
- studies should be made to determine the possibility of electronically merging police records and hospital records of traffic injury in ways that will not violate the protection of the privacy;
- a simple injury scale according to severity should be developed by medical professionals for use by the police and the health emergency services.

## Sources

SafetyNet website

SUPREME, Thematic Report, Statistics and In-Depth Analysis, 17 June 2007

SafetyNet, Final Report of task 1.5, Estimation real number of road accident casualties, 20 March 2008

SafetyNet, Enhancement of the CARE Accident Data, 8 December 2008

ETSC, Report, Social and economic consequences of road traffic injury in Europe, Brussels, 2007

**Measure 61 Develop specifications for on-board accident recording devices, and examine the consequences of various alternatives for certain categories of vehicles**

**Objective:** supporting collision investigation and safety research.

**Description**

Accident recording devices (ARDs) are instruments to record the data a couple of seconds prior and after a crash (therefore not involving behaviour monitoring). The aim is enhancing the understanding of how accidents and collisions happen, but also recognising the potential benefits for prevention and road safety. Moreover, their application can lead to improvements in different domain, namely in legal trials, in the application of victims' rights and in fighting vehicle thefts, insurance frauds and other crimes.

The data collected can be used not only for improving accident investigation and speeding-up of court procedures, but also for enhanced research in in-depth databases of real-life information, which allow for better evaluation of road safety measures in all fields (active and passive vehicle safety, infrastructure, training, regulation and enforcement).

In order to understand the feasibility of implementing accident data recording technology in Europe, the European Commission launched the project VERONICA (Vehicle Event Recording based on Intelligent Crash Assessment).

This study examined the relevant information related to accident recording devices: technical specifications, application on different vehicle classes, harmonisation issues and medical and legal aspects, including privacy issues. It also analysed the impacts on accident prevention and traffic safety and calculated the cost-benefit ratio.

The project produced recommendation about the suitable legal framework for on-board accident recording devices, in particular to improve the European accident databases with real-life collision data.

The follow-up project, VERONICA II, further specified the technical and legal requirements for a possible implementation of accident data recorders in European vehicles. In particular, it has been studied how to capture not only hard crash data, but also data from soft collisions, i.e. with vulnerable road users, who represent a relevant part of road users and victims in accidents. A special focus was given to commercial and professional used vehicles.

Besides these research activities, the Commission co-funded, within the DRIVE II programme, a field test in the UK, Netherlands and Belgium (SAMOVAR-DRIVE project). The project focuses on low cost in-vehicle electronic systems for recording data related to vehicle and its communications to other systems and databases. A total of 341 vehicles equipped with different data recording technologies have been tested. The synthesis of the results shows that the accident rate was reduced by 28% and the accident costs by 40%.

**Classification:** *thematic study.*

**State of implementation**

Duration of the VERONICA project: from 1 January 2005 to 31 December 2006.

Duration of the VERONICA II project: from 1 May 2007 to 30 April 2009.

*Medium advancement*

## Impact on road safety

**Type of impact:** *indirect.*

**Timing of the effects:** *medium term.*

**Consistency with other measures:** the work carried out in the framework of the two VERONICA projects is very much in line with the EC e-safety R&D initiatives, which provide for better accident data to enhance the research for vehicle and infrastructure safety and for accident mitigation. In particular, it has a strong connection with the Measures 58, 59 and 60.

## Ex-post evaluation

### Outcomes

The Final Report (VERONICA, 2006) incorporates the emerging findings from the research carried out within the project. In particular, it presents a list of key information to be collected during a collision. Proposals are also made for recording frequencies.

A number of target groups characterised by an elevated accident or damage risk have been identified as priority for collision data collection: hazardous goods vehicles, coaches, buses, emergency vehicles, other commercial vehicles, motorcycles and young drivers. Concerning passenger cars, instead, the implementation of these devices is presently not indicated, but it can be considered in the future.

**Effectiveness:** *medium.*

A remarkable preventive effect can be achieved with the use of accident data recorders, which seems to impact on driver's behaviour. According to several studies, the number of accidents is reduced between 20% and 30% and accident costs are reduced by 40% (VDO, 1998).

**Efficiency:** *medium.*

VERONICA I project cost: n.a.

VERONICA I project EC funding: n.a.

VERONICA II project cost: 2,166,864 euro

VERONICA II project EC funding: 1,083,432 euro

The research has not yet received a concrete application.

**Sustainability:** *medium.*

The development of specifications for on-board accident recording devices has near future application and long term perspectives. The acceptability of these devices to the public may affect the sustainability of such devices.



## Results

**Description of the impact:** Accident recording devices support an improved collision investigation, the collection of real-life data for research, rescue advancements, infrastructure and vehicle design improvements, all acknowledged means to improve road safety.

Moreover, besides the indirect impacts on road safety, the use of accident data recorders in fleets shows that a considerable preventive effect can be achieved.

**Contribution to road safety:** *medium results.*

**What remains to be done (ERSAP 2011-2020):** the results of the research need to be applied.

According to the recommendation contained in the VERONICA II Final Report, a Directive based on the purpose of road safety would provide the best way to achieve the implementation of accident data recorders in the European Union. Meanwhile, the acceptability of these devices to the public should be assessed.

## Sources

VERONICA, Vehicle Event Recording based on Intelligent Crash Assessment, Project Final Report, 29 November 2006

VERONICA II, Vehicle Event Recording based on Intelligent Crash Assessment, Final Report, 6 October 2009

Europa press release IP/06/1885, Commission to support 13 European road safety projects for euro 8,1 million, 21 December 2006

VDO Kienzle, Accident Data Recorder - A Contribution to Road Safety, 1998

**Measure 62 Establish a European methodology for independent road accident investigations and set up a group of independent experts meeting within the Commission**

**Objective:** developing a common methodology in transport accident investigations.

**Description**

Accident investigations aim to identify the circumstances and the causes of accidents and to draw conclusions thereof so that appropriate measures can be taken to prevent them from happening again.

Currently, across Europe there is a wide range of accident investigation procedures and protocols in place applied by the police, insurance companies, researchers and other accident investigators.

In 2004 the European Commission set up a group of twelve experts to assist it in defining a shared strategy in transport accident investigations (ROSAT working group, Road Accident Independent Investigations).

The ROSAT group aimed at defining a reference methodology for European and national authorities in order to allow independent, effective and competent safety investigations. It has issued recommendations on methodology issues applicable to all modes of transport and recommendations on road accident investigations.

Meanwhile, the project QUERY (Developing guidelines for a best practice qualification of accident analysts) was initiated to investigate how the professional profile of specialists in accident reconstruction is integrated into the different legal systems of the EU Member States.

At the same time, the SafetyNet project was launched. Within the project framework, the 4<sup>th</sup> Work Package gathered together 20 road safety researchers with the aim of establishing the requirements for the creation of transparent and independent road accident investigations in all Member States according to a common European investigation methodology. The final objective is addressing the need to have detailed, public, transparent and independent road accident data at European level.

The research carried out an investigation of a sample of routine accidents as well as of major accidents and resulted in a set of recommendation whose primary focus is on safety oriented investigation.

**Classification:** *thematic study.*

**State of implementation**

Duration of the ROSAT project: from 1 July 2004 to 31 July 2006.

Duration of the SafetyNet project: from 1 May 2004 to 31 October 2008.

Duration of the QUERY project: from 15 July 2004 to 14 July 2006.

*Completed*

**Impact on road safety**

**Type of impact:** *indirect.*

**Timing of the effects:** *medium term.*

**Consistency with other measures:** enhancing road accident investigation is consistent with the objective of expanding the scope of CARE database to include the causes of accidents (see Measure 59). Already, specialist teams conducted safety oriented road accident investigations to gather data for the accident causation database developed in the framework of the SafetyNet Work Package 5.

Moreover, there is a clear link with measures regarding vehicle safety; in fact, in order to assess the efficiency of new vehicle safety systems there is the need to collect a great number of real-life accident data before gathering enough evidence to issue a general recommendation to incorporate a certain system to all new vehicles. This evaluation process could be significantly enhanced if accident data from different countries could be combined thanks to a shared accident investigation strategy.

In this regard, it is relevant the subsidiary action with the objectives of the eSAFETY Forum Working Group on Accident Causation Data, that has been working for improved accident analysis methodologies (see Measure 37), and of the CARS 21 initiative, whose aim is making recommendations for the public policy and regulatory framework for the European automotive industry (see Measure 21).

There is also a clear link with measures regarding infrastructure safety, since a prerequisite to help formulating road safety policies is that a critical number of cases are investigated.

In addition, independent investigations that systematically address the identification of potentially dangerous behaviour and recurrent human mistakes support the definition of possible measures to deal with them.

Finally, this measure is complementary with the aim of developing specifications for on-board accident recording devices (Measure 61). In fact, accident recorders complete the information collected by police or other staff in order to obtain detailed information on accident circumstances in a very useful manner for traffic safety research.

## **Ex-post evaluation**

### **Outcomes**

One of the ROSAT working group's most important achievement was to develop a common European methodology for safety investigation of accidents in the transport sector designed to produce a harmonised and consistent approach across the European Union. The final result is a 90 pages document and a list of 34 remarks, conclusions and recommendations issued both at national and at EU level.

The methodology adopted establishes the principles, standards and powers to pursue safety investigations in an independent, effective and competent way.

The QUERY project produced 25 Country Status Reports with an overview of the various legal systems and the required professional qualifications of the experts in accident reconstruction. Through consultations with the participant countries, the professional profile of the expert in accident reconstruction was analysed, and guidelines for a "Best Practice Qualification" were developed. The final result was the adoption of the Proposal for European Guidelines in Accident Reconstruction.

Finally, the 4th Work Package of the SafetyNet project produced 21 recommendations (SafetyNet, 2008). According to the document, these recommendations should be viewed as the starting point for future projects aiming to implement a European safety oriented road accident investigation programme and working towards a common European accident investigation methodology.

**Effectiveness:** *not computable.*

**Efficiency:** *not computable.*

QUERY project cost: 120,000 euro

QUERY project EC funding: 60,000 euro

SafetyNet project cost: 19,470,000 euro

SafetyNet project EC funding: 9,999,999 euro

ROSAT project cost: n.a.

ROSAT project EC funding: n.a.

**Sustainability:** *high.*

The common European methodology for safety investigation of accidents is expected to provide a durable framework for action at national level.

The network of independent experts will support cooperation across the EU in the long period.

## Results

**Description of the impact:** proper accident investigations methodology can lead to significant improvement of knowledge concerning safety approaches in technical, infrastructural and driver behaviour terms.

**Contribution to road safety:** *low results.*

**What remains to be done (ERSAP 2011-2020):** a comprehensive set of tools for a suitable pan-European in-depth accident data collection and analysis has been developed and successfully tested.

The concrete Europe-wide implementation is still missing. In a first step, a full scale pilot project (co-financed by the EC) should be implemented. In a second step, a legislative framework should be drafted as to ensure that, on a permanent basis: (i) Member States collect data in a proper way, and (ii) the cost of data collection is co-financed by the EC.

## Sources

SafetyNet website

European Commission Decision 2003/425/EC setting up a group of experts to advise the Commission on a strategy for dealing with accidents in the transport sector, 11 June 2003

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